

**Region 10
U.S. Environmental Protection
Agency**

DRAFT FINAL

**Phase I Sediment Sampling
Data Evaluation
Upper Columbia River Site
CERCLA RI/FS
Section 2 pages 16-65**

August 25, 2006

Prepared by

CH2MHILL



CONTRACT NO 68-S7-04-01

SECTION 2

Field and Analytical Program Overview

FIGURE 2-1

Lake Roosevelt Water Level During 2005 Sediment Sampling Program

Upper Columbia River RI/FS

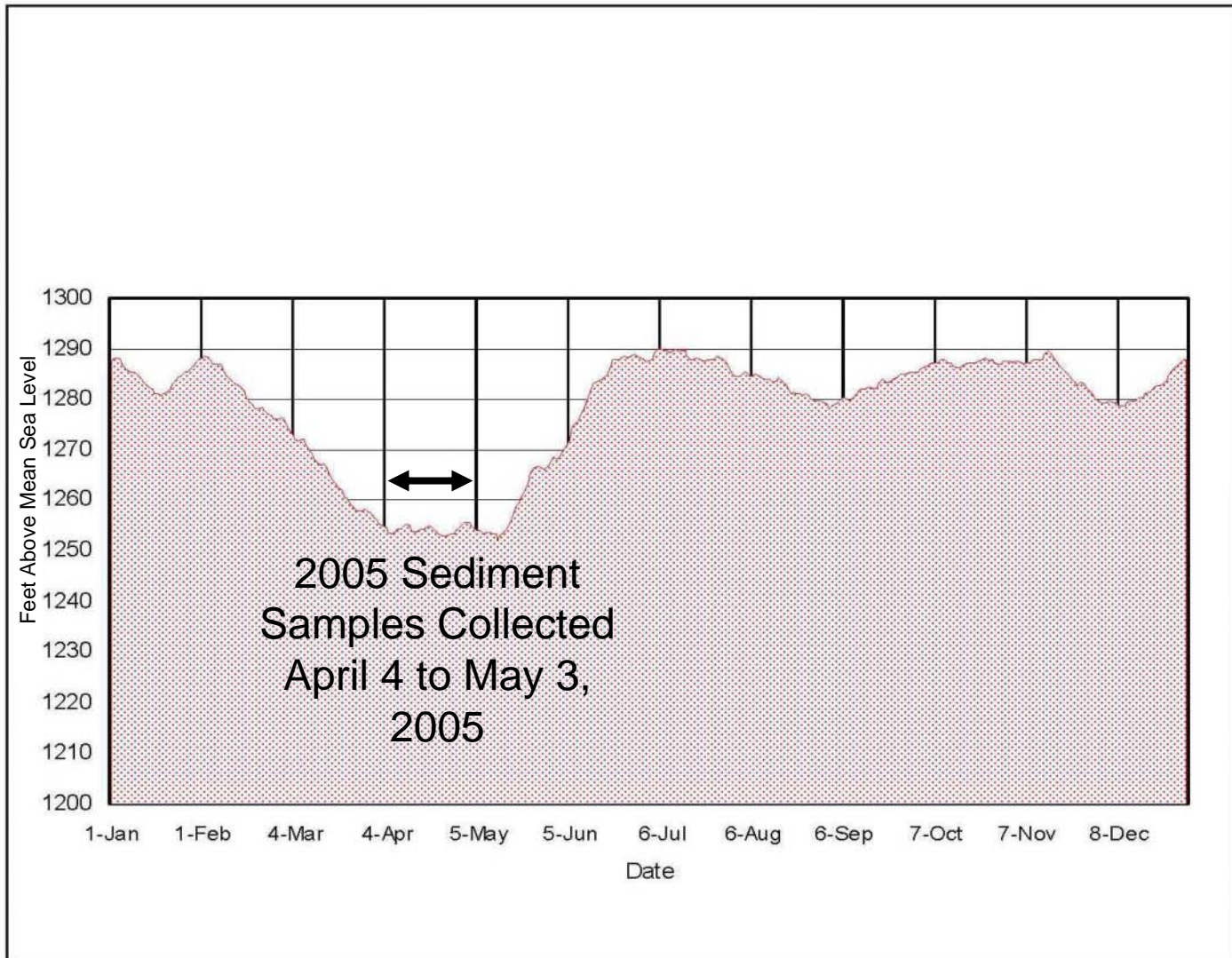
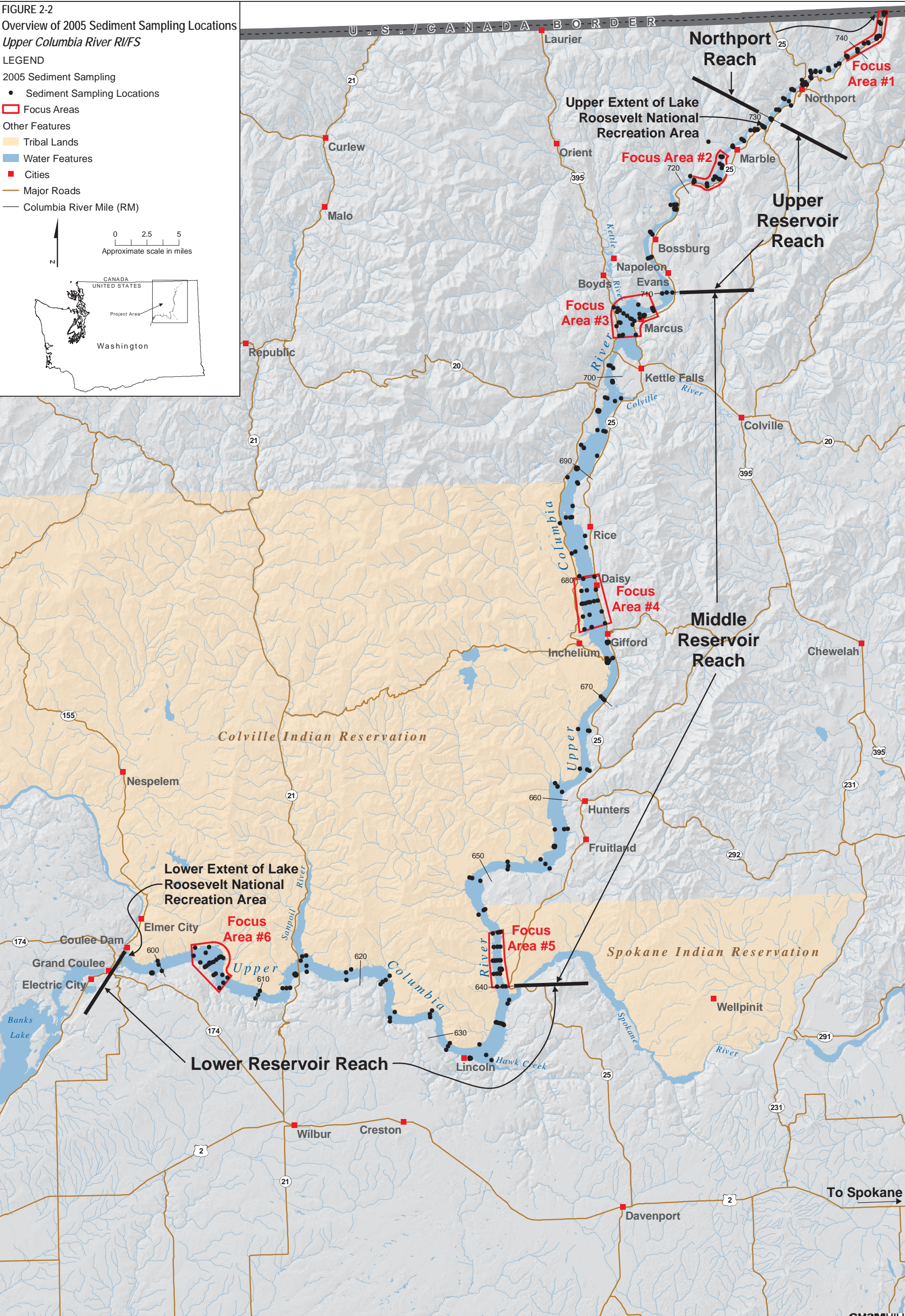
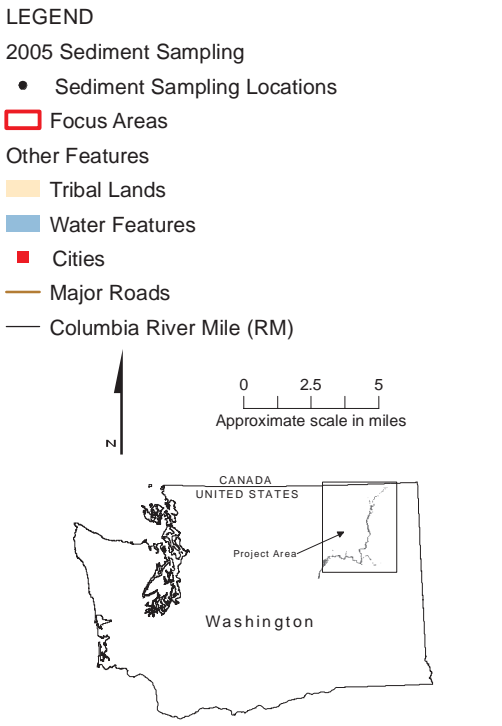
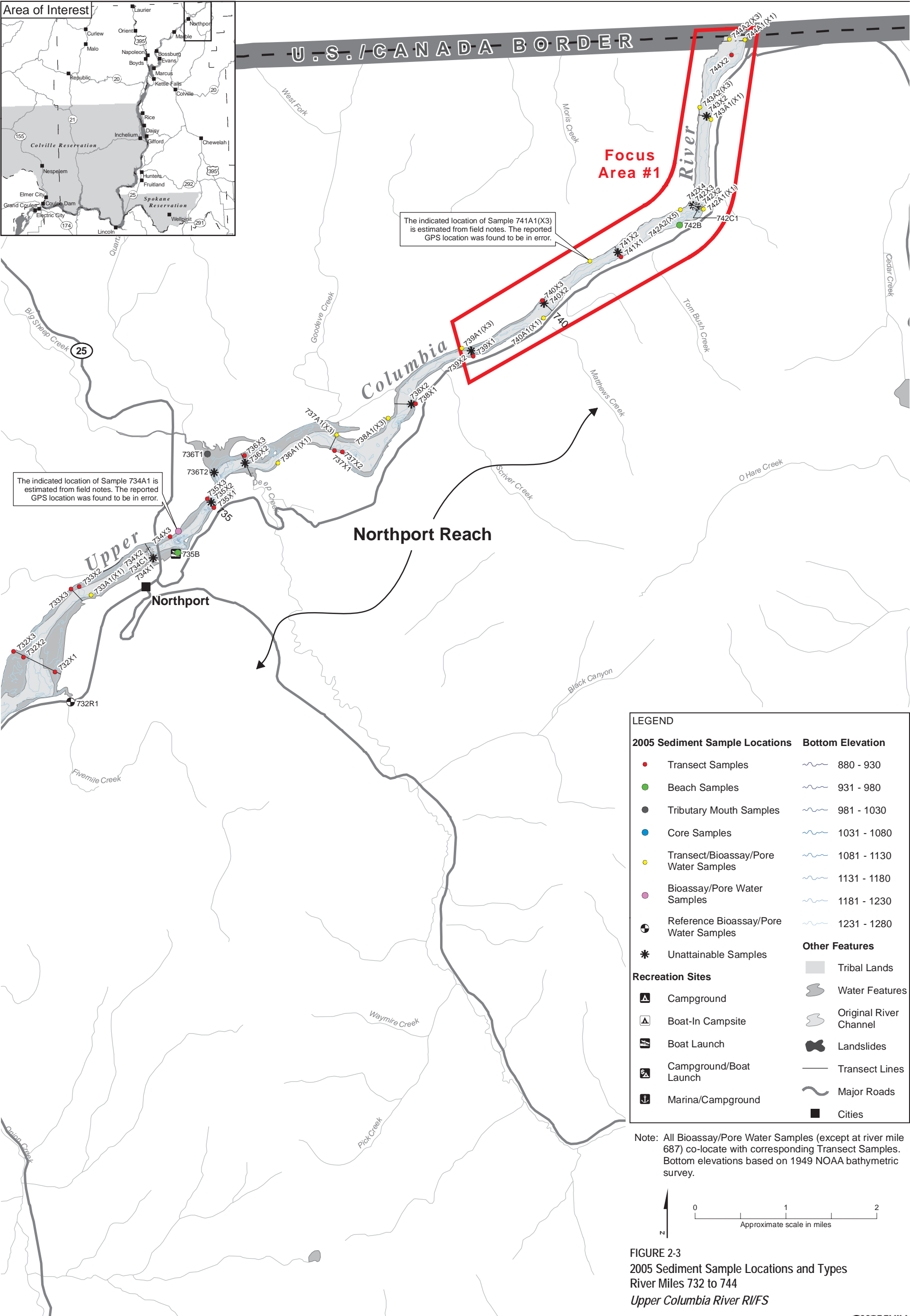
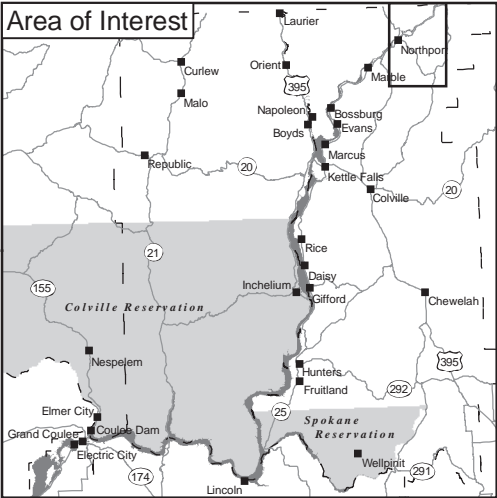


FIGURE 2-2
Overview of 2005 Sediment Sampling Locations
Upper Columbia River RI/FS





LEGEND

2005 Sediment Sample Locations		Bottom Elevation
●	Transect Samples	880 - 930
●	Beach Samples	931 - 980
●	Tributary Mouth Samples	981 - 1030
●	Core Samples	1031 - 1080
●	Transect/Bioassay/Pore Water Samples	1081 - 1130
●	Bioassay/Pore Water Samples	1131 - 1180
●	Reference Bioassay/Pore Water Samples	1181 - 1230
●	Unattainable Samples	1231 - 1280

Recreation Sites		Other Features
▲	Campground	▬ Tribal Lands
▲	Boat-In Campsite	▬ Water Features
▲	Boat Launch	▬ Original River Channel
▲	Campground/Boat Launch	▬ Landslides
▲	Marina/Campground	▬ Transect Lines
		▬ Major Roads
		■ Cities

Note: All Bioassay/Pore Water Samples (except at river mile 687) co-locate with corresponding Transect Samples. Bottom elevations based on 1949 NOAA bathymetric survey.

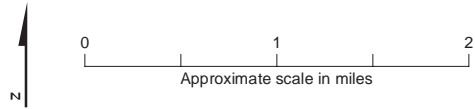
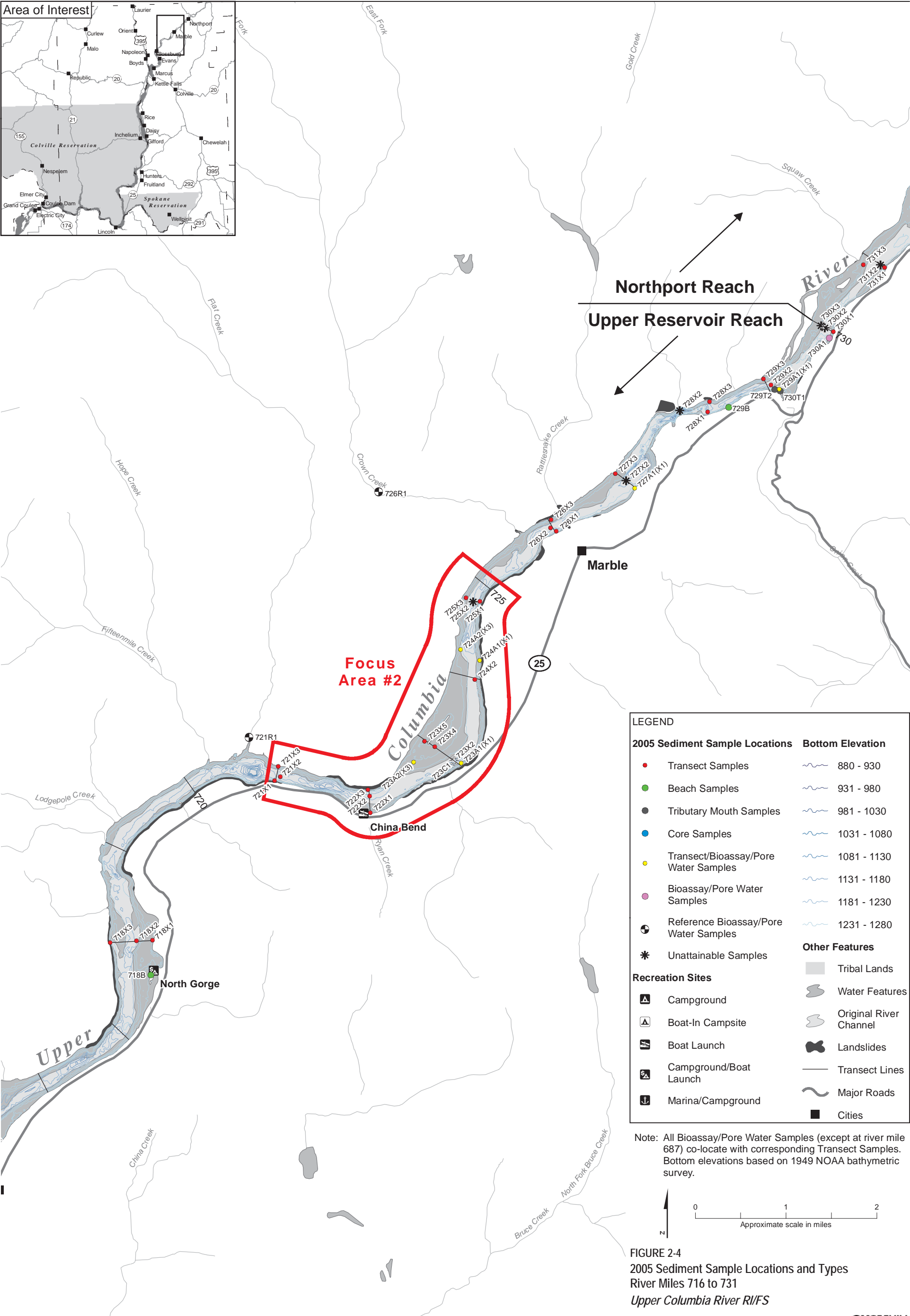
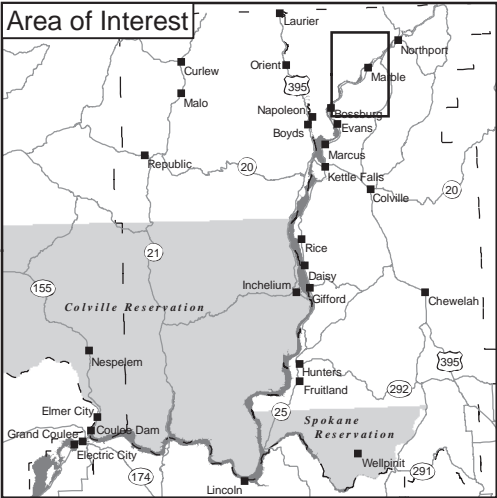


FIGURE 2-3
2005 Sediment Sample Locations and Types
River Miles 732 to 744
Upper Columbia River RI/FS



LEGEND

2005 Sediment Sample Locations	Bottom Elevation
Transect Samples	880 - 930
Beach Samples	931 - 980
Tributary Mouth Samples	981 - 1030
Core Samples	1031 - 1080
Transect/Bioassay/Pore Water Samples	1081 - 1130
Bioassay/Pore Water Samples	1131 - 1180
Reference Bioassay/Pore Water Samples	1181 - 1230
Unattainable Samples	1231 - 1280

Recreation Sites	Other Features
Campground	Tribal Lands
Boat-In Campsite	Water Features
Boat Launch	Original River Channel
Campground/Boat Launch	Landslides
Marina/Campground	Transect Lines
	Major Roads
	Cities

Note: All Bioassay/Pore Water Samples (except at river mile 687) co-locate with corresponding Transect Samples. Bottom elevations based on 1949 NOAA bathymetric survey.

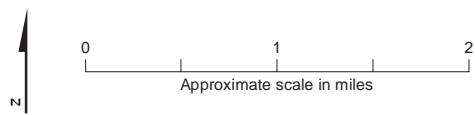


FIGURE 2-4
2005 Sediment Sample Locations and Types
River Miles 716 to 731
Upper Columbia River RI/FS

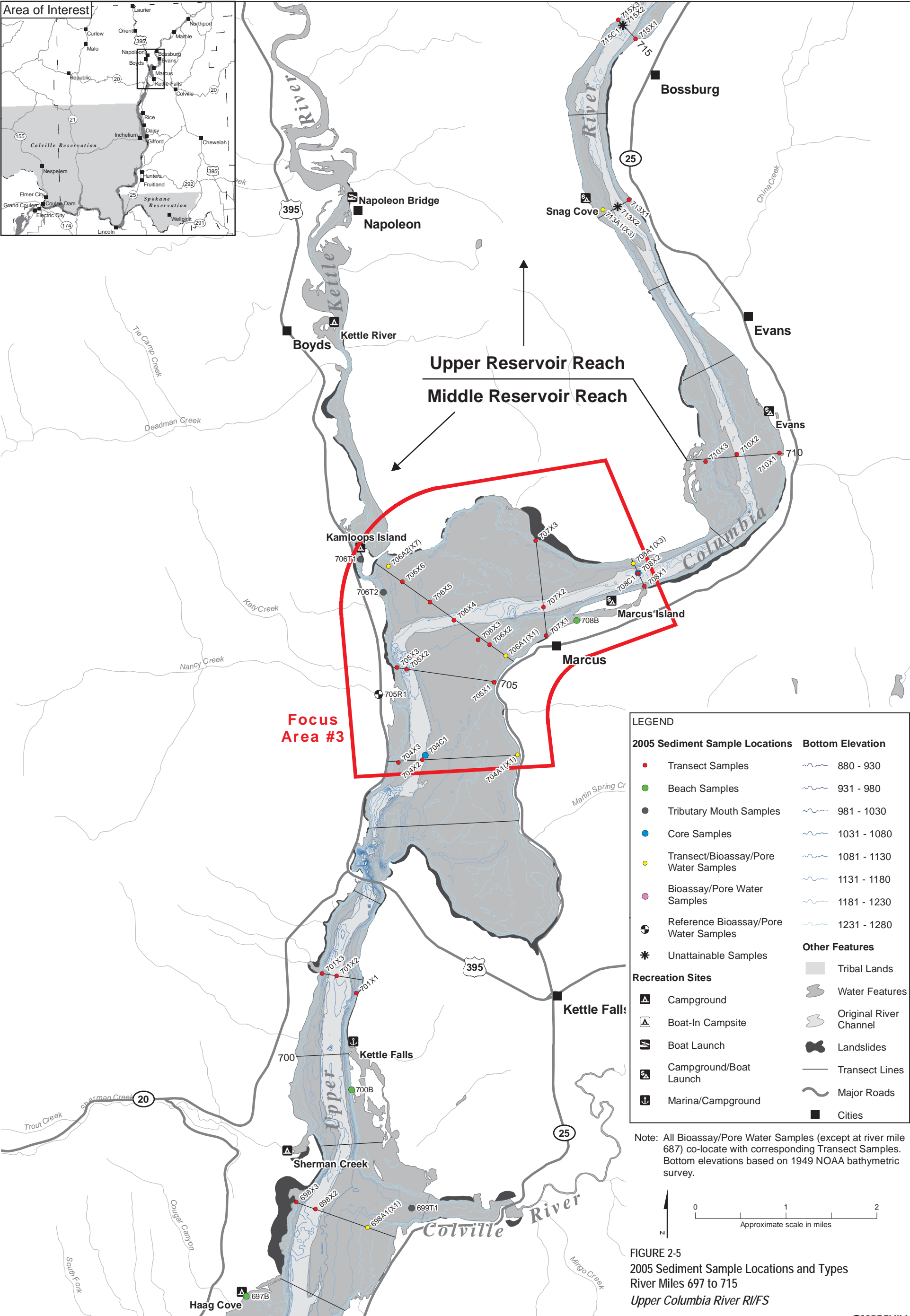
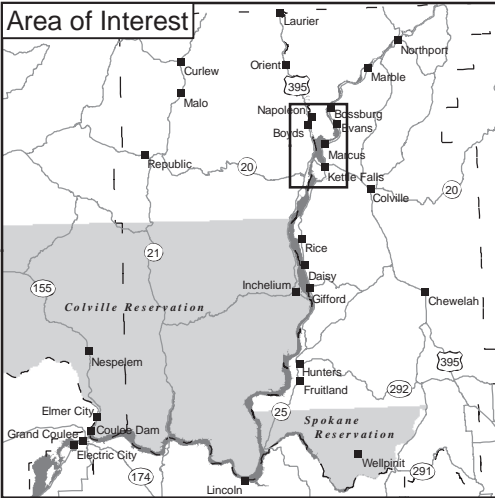


FIGURE 2-5
2005 Sediment Sample Locations and Types
River Miles 697 to 715
Upper Columbia River RI/FS

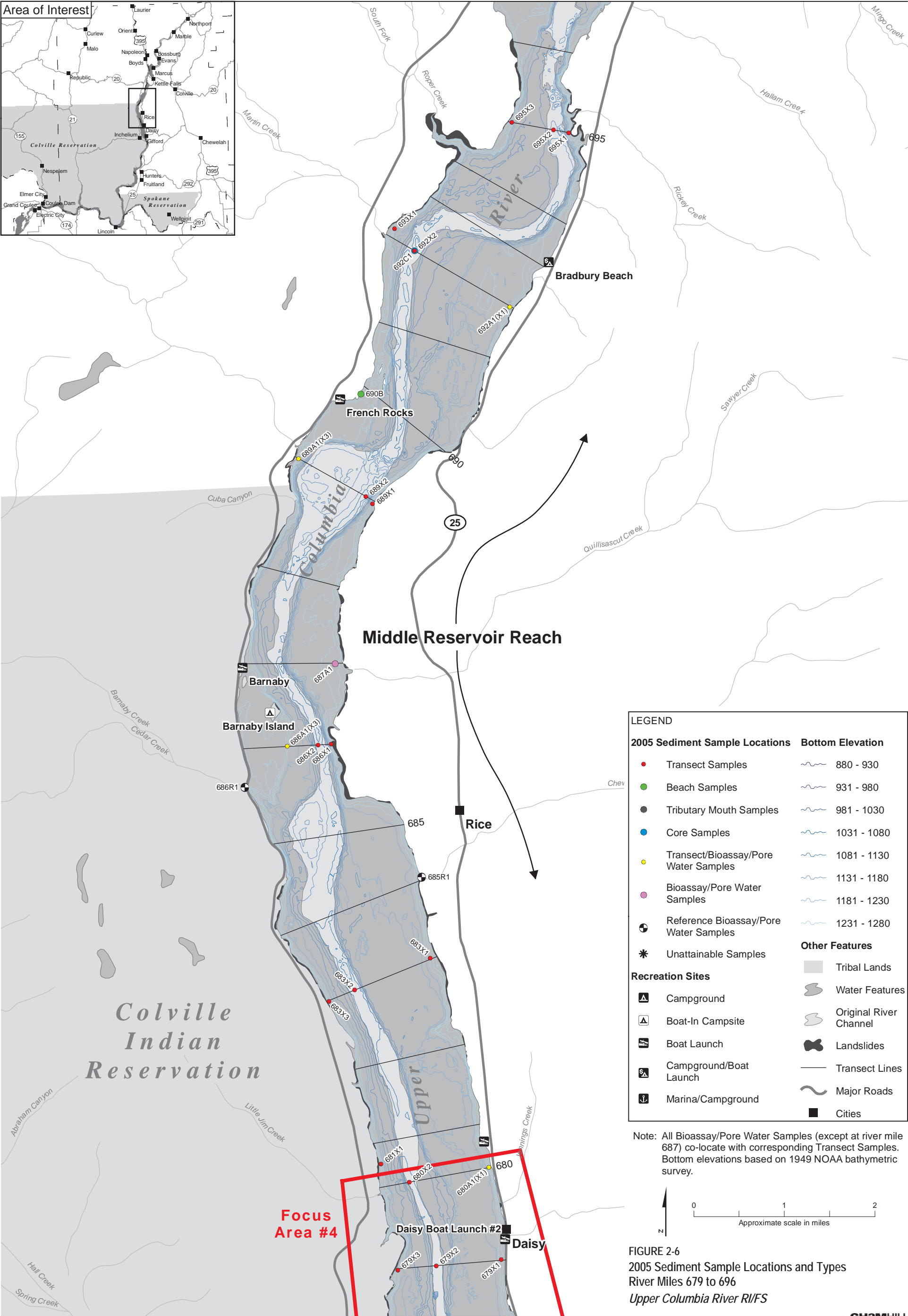
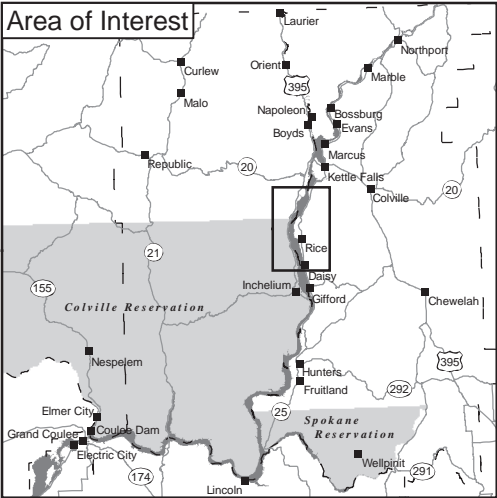


FIGURE 2-6
2005 Sediment Sample Locations and Types
River Miles 679 to 696
Upper Columbia River RI/FS

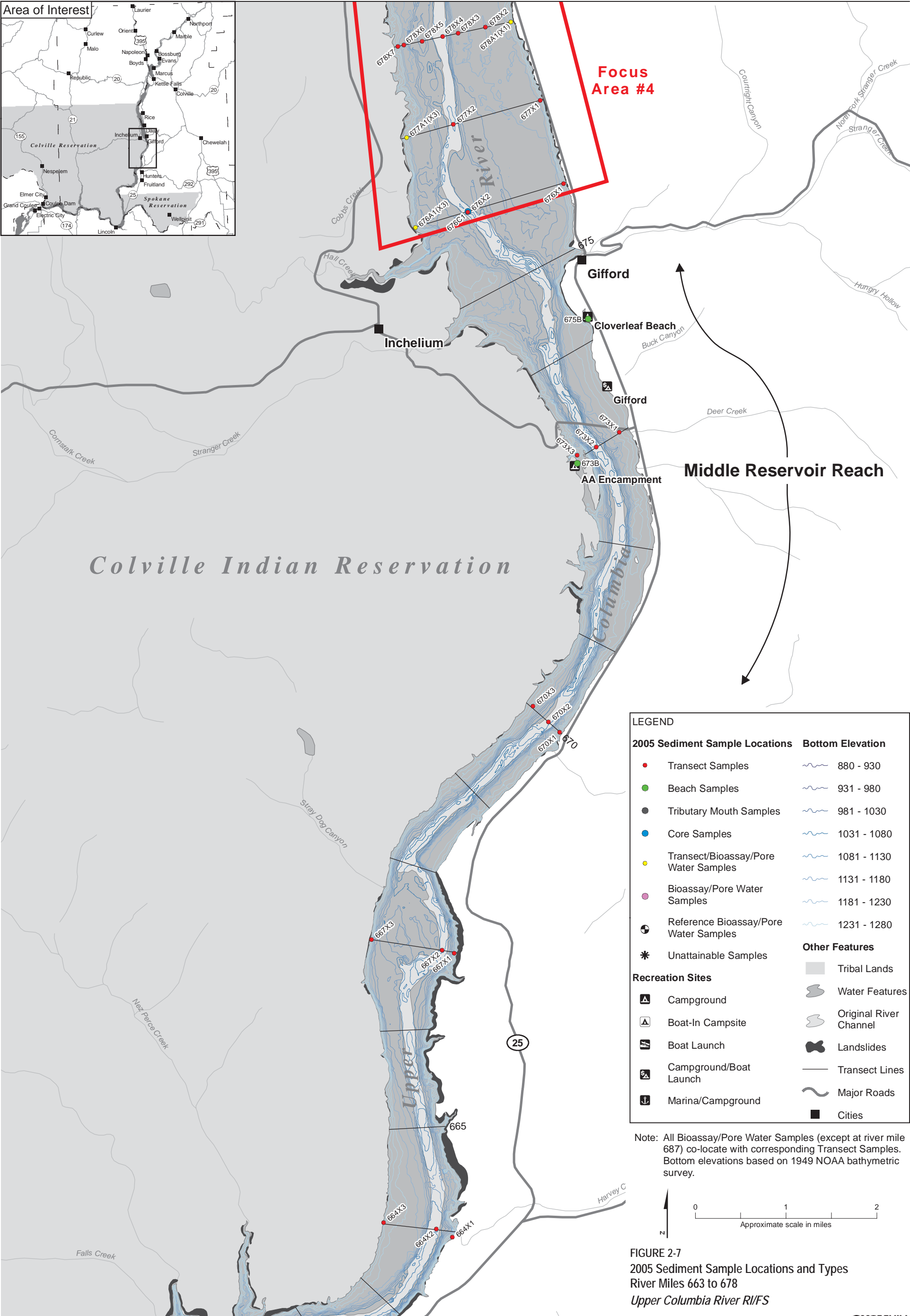
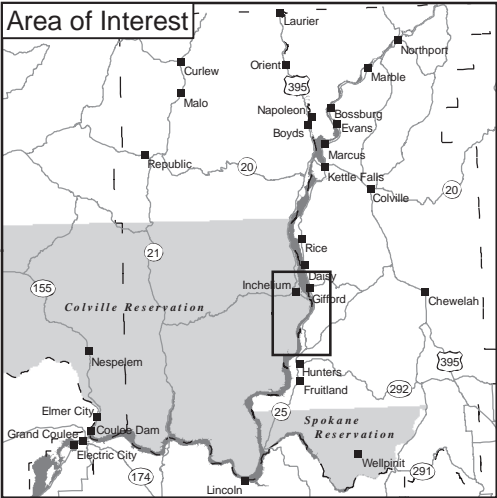


FIGURE 2-7
2005 Sediment Sample Locations and Types
River Miles 663 to 678
Upper Columbia River RI/FS

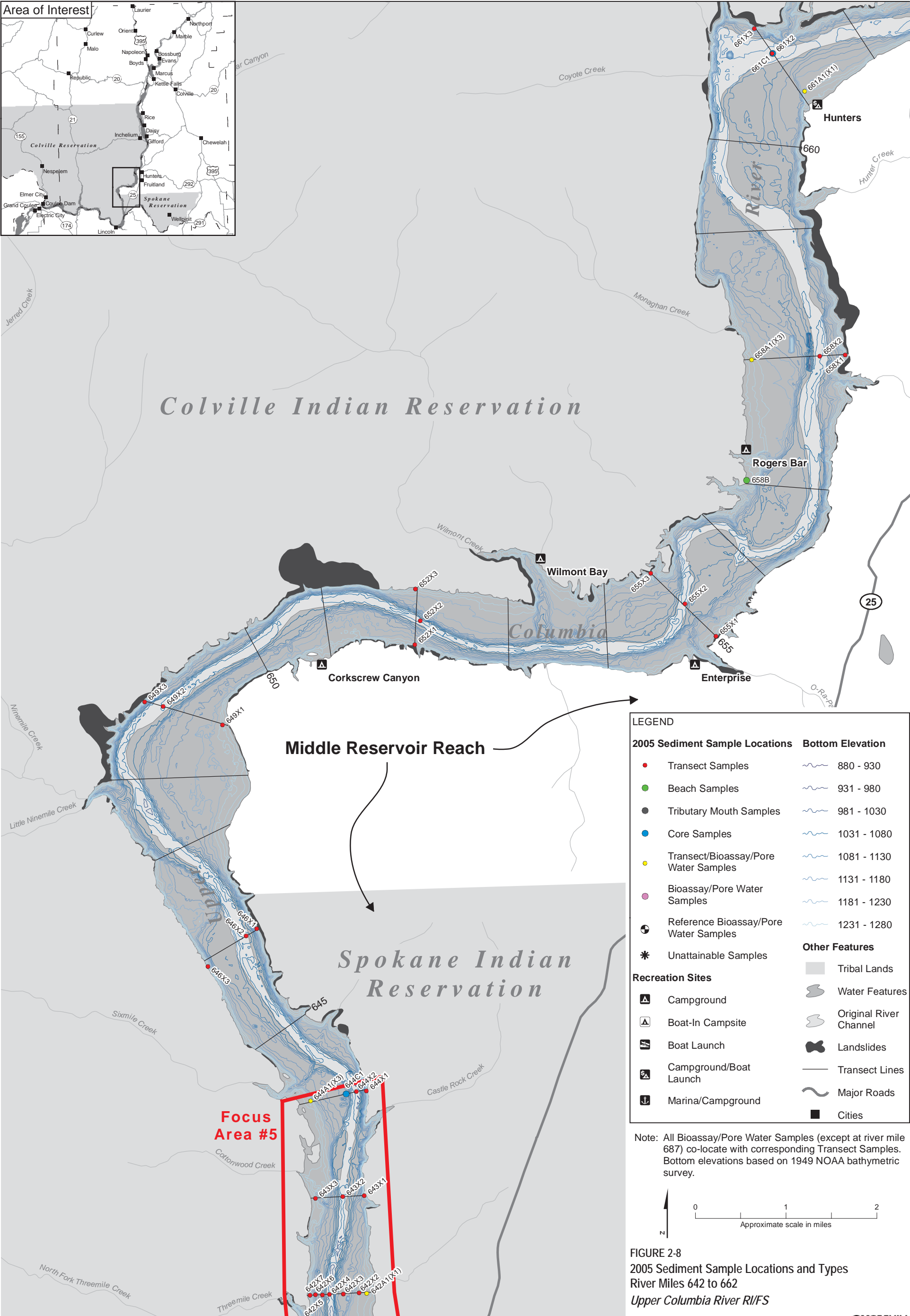
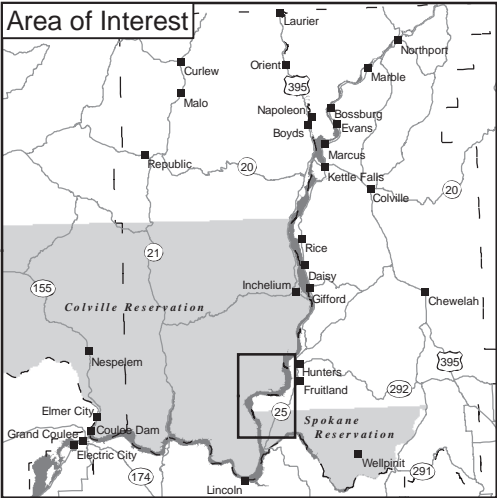


FIGURE 2-8
2005 Sediment Sample Locations and Types
River Miles 642 to 662
Upper Columbia River RI/FS

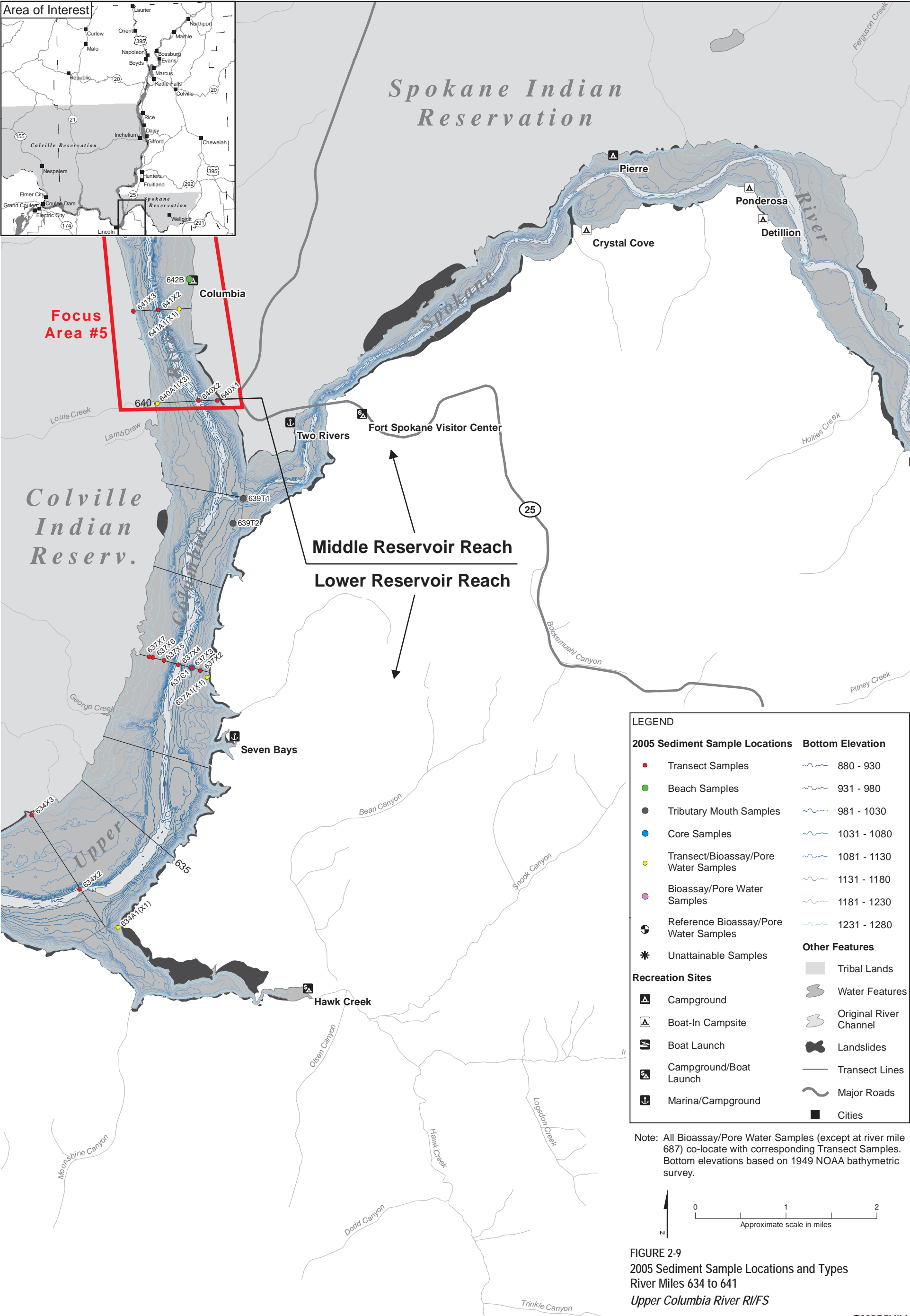
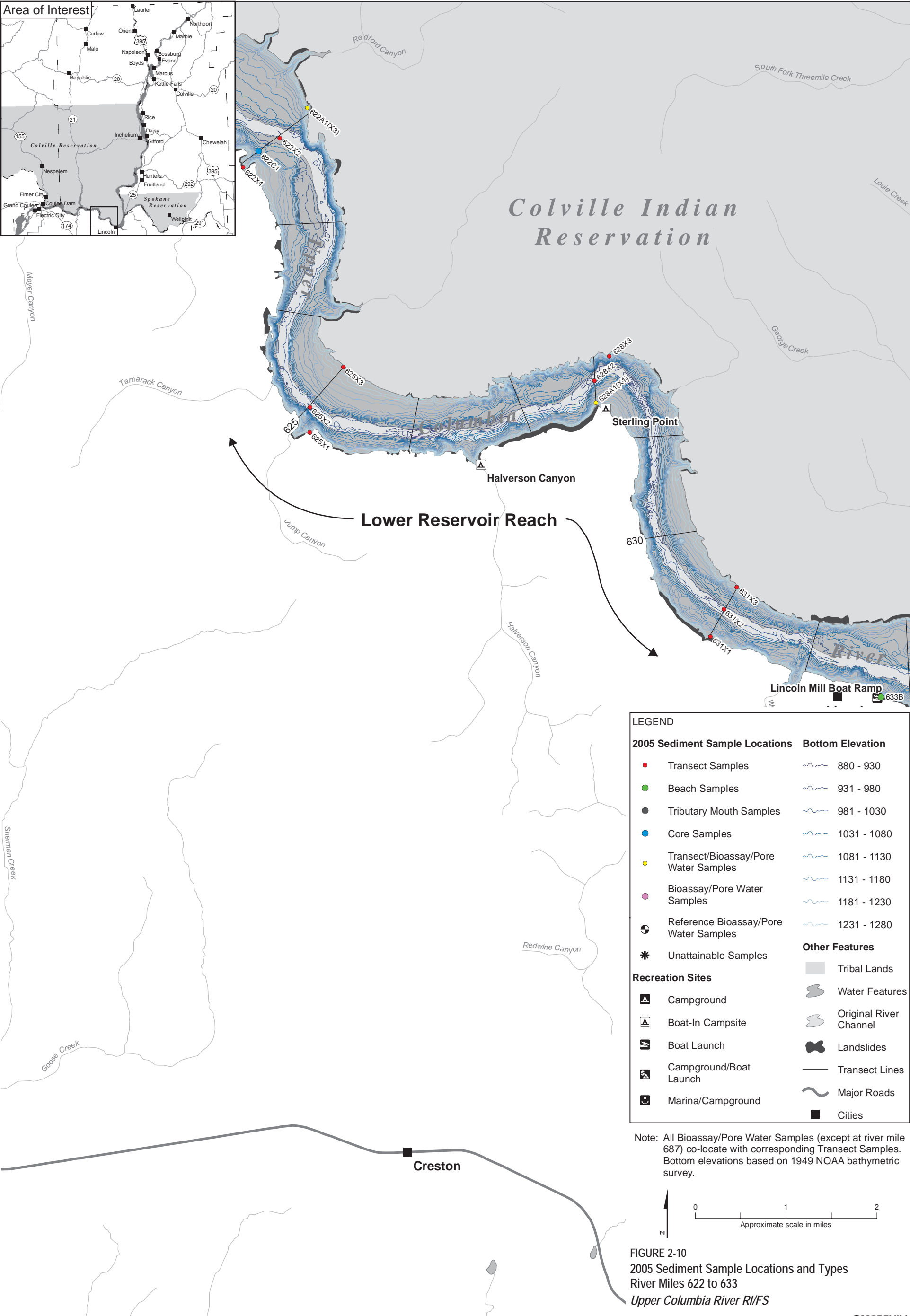
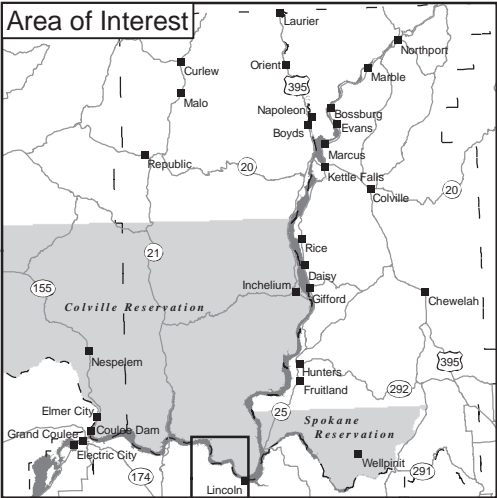


FIGURE 2-9
2005 Sediment Sample Locations and Types
River Miles 634 to 641
Upper Columbia River R/FS



LEGEND

2005 Sediment Sample Locations		Bottom Elevation
●	Transect Samples	880 - 930
●	Beach Samples	931 - 980
●	Tributary Mouth Samples	981 - 1030
●	Core Samples	1031 - 1080
●	Transect/Bioassay/Pore Water Samples	1081 - 1130
●	Bioassay/Pore Water Samples	1131 - 1180
●	Reference Bioassay/Pore Water Samples	1181 - 1230
●	Unattainable Samples	1231 - 1280

Recreation Sites		Other Features
▲	Campground	Tribal Lands
▲	Boat-In Campsite	Water Features
▲	Boat Launch	Original River Channel
▲	Campground/Boat Launch	Landslides
▲	Marina/Campground	Transect Lines
		Major Roads
		Cities

Note: All Bioassay/Pore Water Samples (except at river mile 687) co-locate with corresponding Transect Samples. Bottom elevations based on 1949 NOAA bathymetric survey.

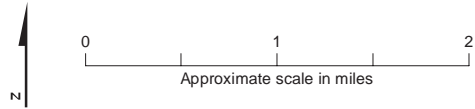
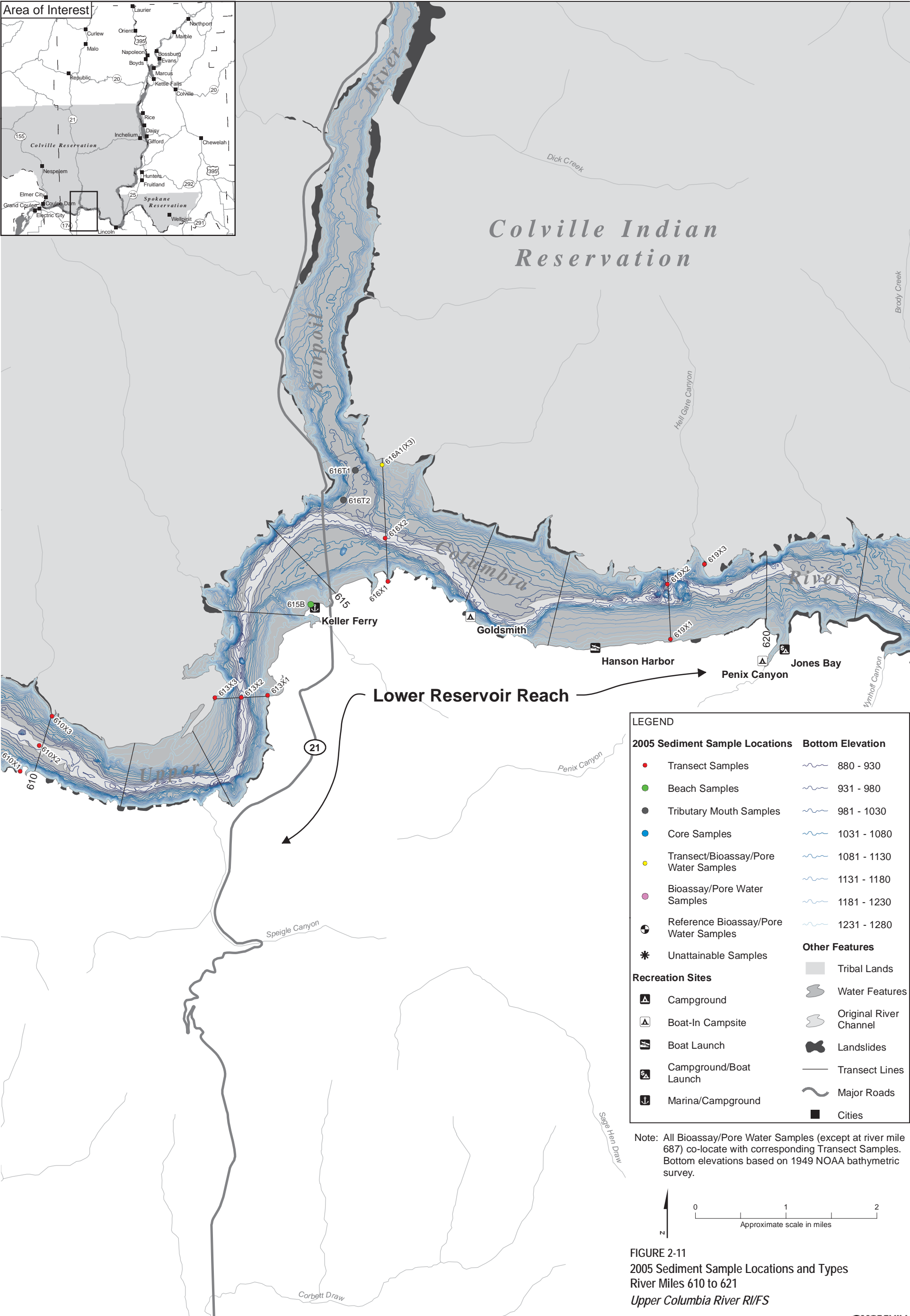
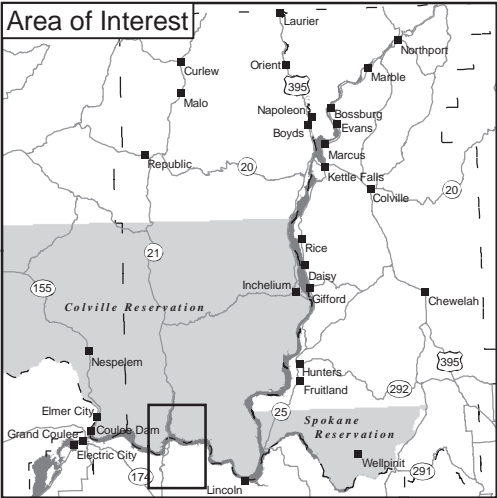


FIGURE 2-10
2005 Sediment Sample Locations and Types
River Miles 622 to 633
Upper Columbia River RI/FS



LEGEND

2005 Sediment Sample Locations		Bottom Elevation
●	Transect Samples	880 - 930
●	Beach Samples	931 - 980
●	Tributary Mouth Samples	981 - 1030
●	Core Samples	1031 - 1080
●	Transect/Bioassay/Pore Water Samples	1081 - 1130
●	Bioassay/Pore Water Samples	1131 - 1180
●	Reference Bioassay/Pore Water Samples	1181 - 1230
●	Unattainable Samples	1231 - 1280

Recreation Sites		Other Features
▲	Campground	▬ Tribal Lands
▲	Boat-In Campsite	▬ Water Features
▲	Boat Launch	▬ Original River Channel
▲	Campground/Boat Launch	▬ Landslides
▲	Marina/Campground	▬ Transect Lines
		▬ Major Roads
		■ Cities

Note: All Bioassay/Pore Water Samples (except at river mile 687) co-locate with corresponding Transect Samples. Bottom elevations based on 1949 NOAA bathymetric survey.

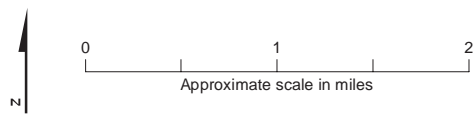


FIGURE 2-11
2005 Sediment Sample Locations and Types
River Miles 610 to 621
Upper Columbia River RI/FS

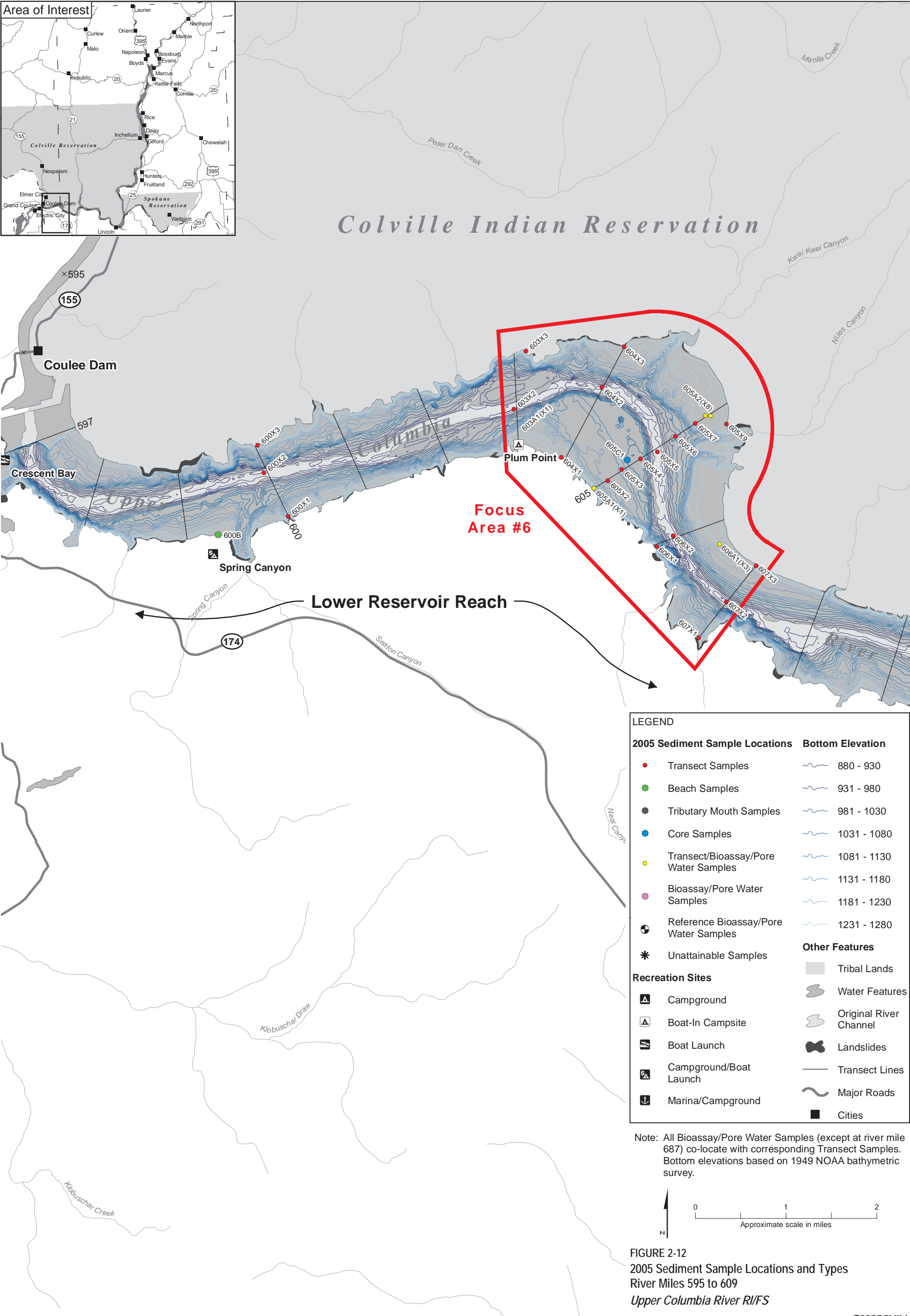
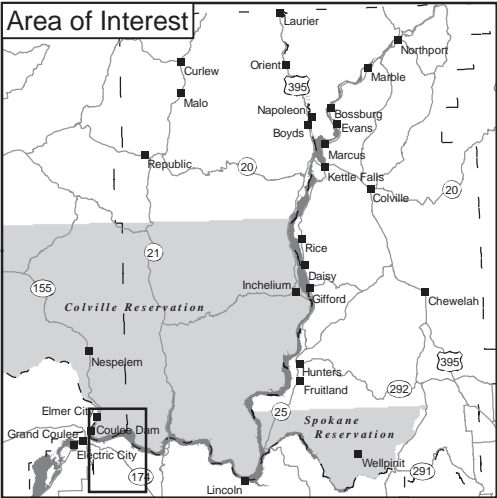


FIGURE 2-12
2005 Sediment Sample Locations and Types
River Miles 595 to 609
Upper Columbia River RI/FS



2005 Beach Sediment Sample Locations

LEGEND

2005 Beach Sampling

- Beach Subsample Composites
- Beach Subsamples

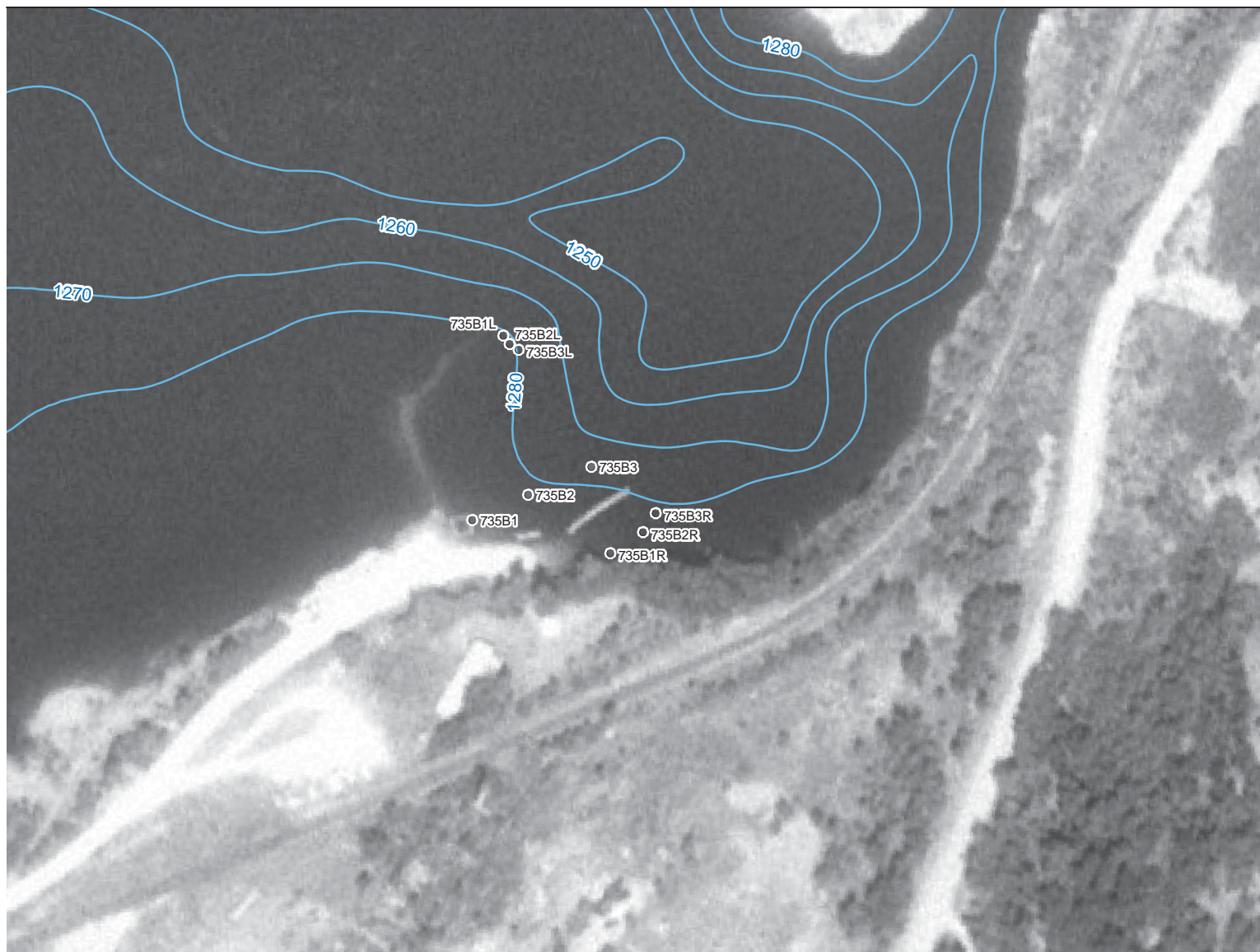
1949 NOAA Bathymetry

- 10-foot Bottom Elevation Contours

FIGURE 2-13

Black Sand Beach - RM 742
2005 Beach Sample Locations
Upper Columbia River RI/FS

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2005 Beach Sediment Sample Locations

LEGEND

2005 Beach Sampling

- Beach Subsample Composites
- Beach Subsamples

1949 NOAA Bathymetry

- 10-foot Bottom Elevation Contours

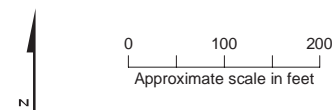
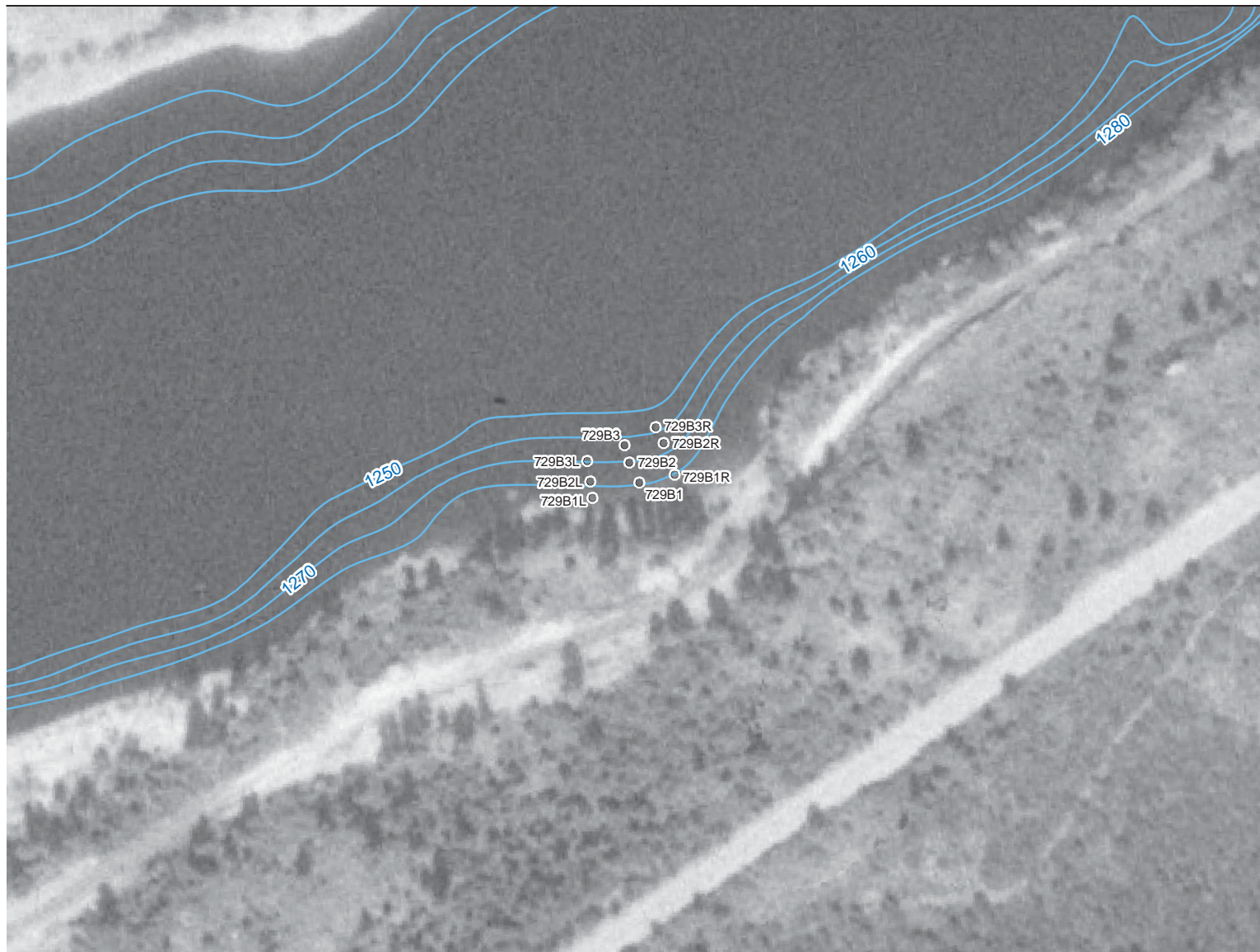


FIGURE 2-14
Northport City Boat Launch
2005 Beach Sample Locations
Upper Columbia River RI/FS

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2005 Beach Sediment Sample Locations

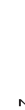
LEGEND

2005 Beach Sampling

- Beach Subsample Composites
- Beach Subsamples

1949 NOAA Bathymetry

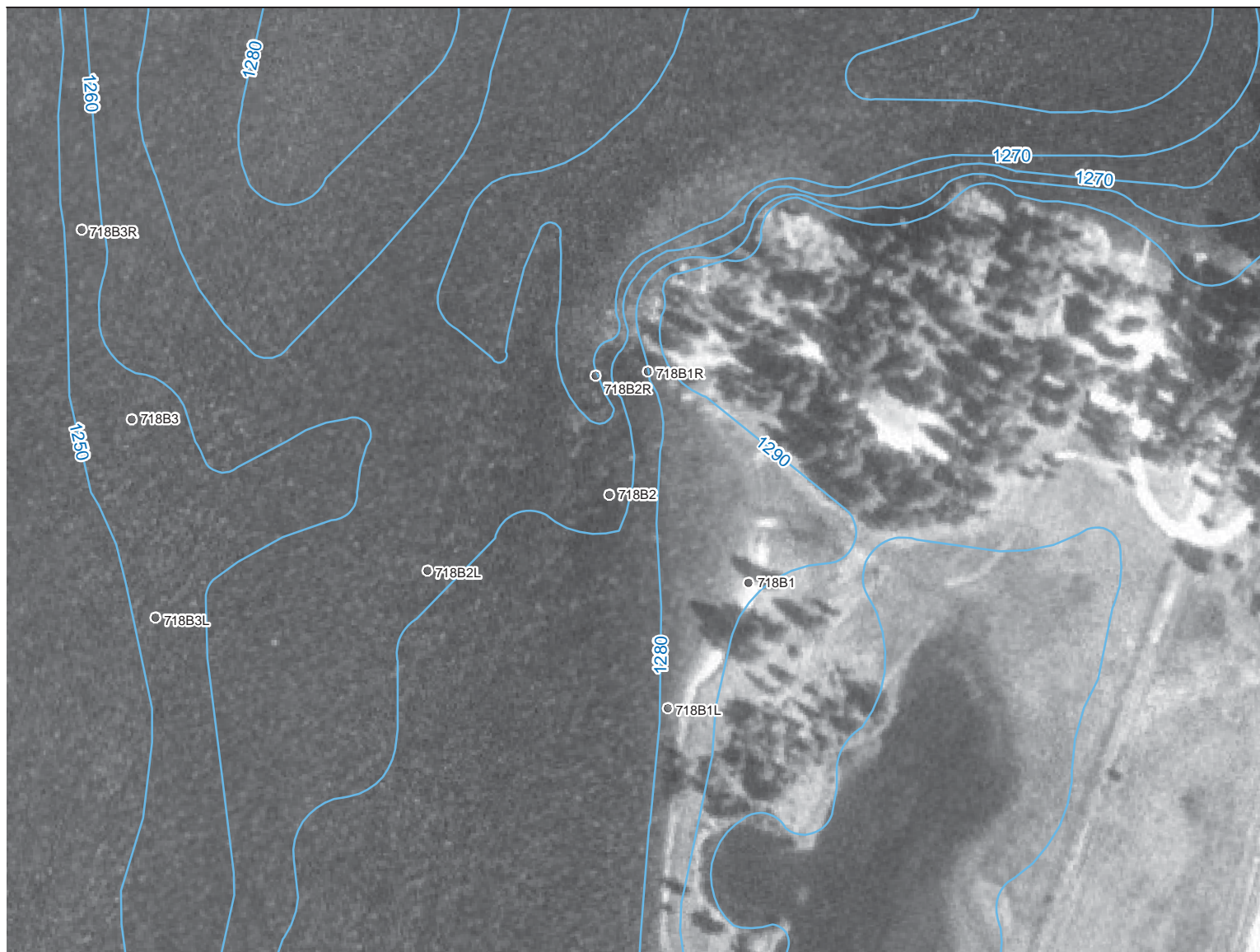
- 10-foot Bottom Elevation Contours



0 100 200
Approximate scale in feet

FIGURE 2-15
Dalles Orchard
2005 Beach Sample Locations
Upper Columbia River RI/FS

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2005 Beach Sediment Sample Locations

LEGEND

2005 Beach Sampling

- Beach Subsample Composites
- Beach Subsamples

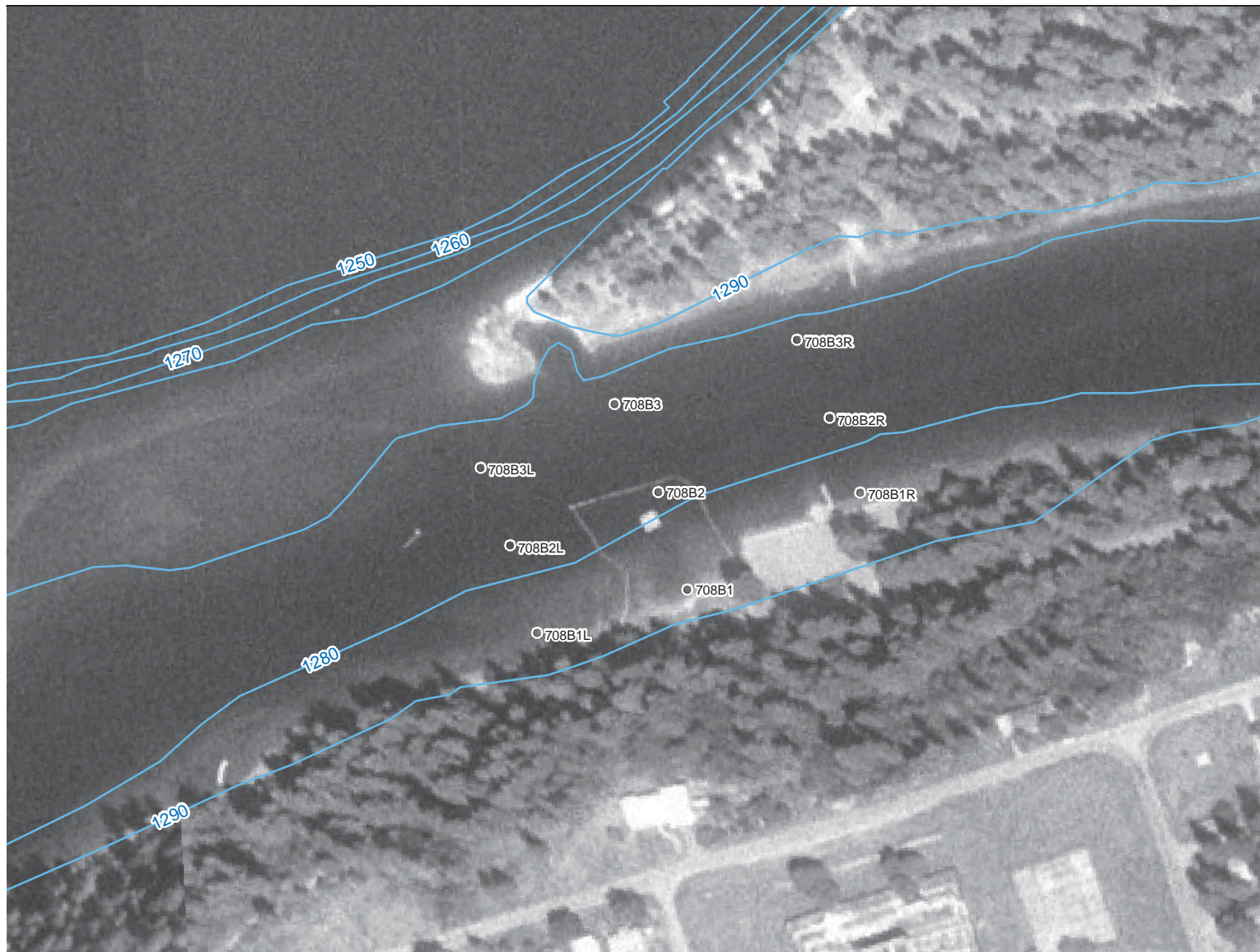
1974 USBR Bathymetry

- 10-foot Bottom Elevation Contours



0 100 200
Approximate scale in feet

FIGURE 2-16
North Gorge Campground
2005 Beach Sample Locations
Upper Columbia River RI/FS



2005 Beach Sediment Sample Locations

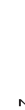
LEGEND

2005 Beach Sampling

- Beach Subsample Composites
- Beach Subsamples

1974 USBR Bathymetry

- 10-foot Bottom Elevation Contours

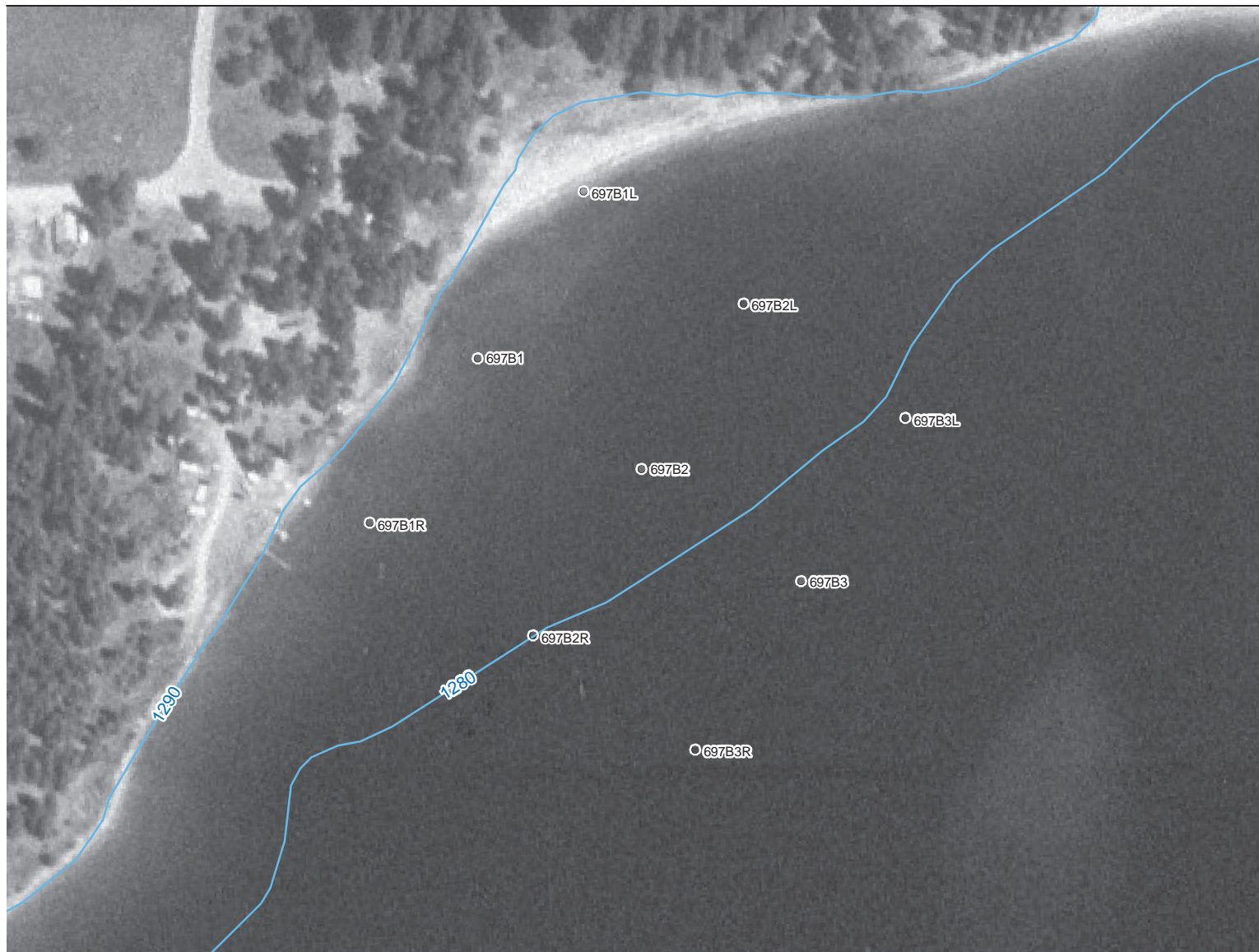


0 100 200
Approximate scale in feet

FIGURE 2-17
Marcus Island Campground
2005 Beach Sample Locations
Upper Columbia River RI/FS

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2005 Beach Sediment Sample Locations

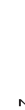
LEGEND

2005 Beach Sampling

- Beach Subsample Composites
- Beach Subsamples

1974 USBR Bathymetry

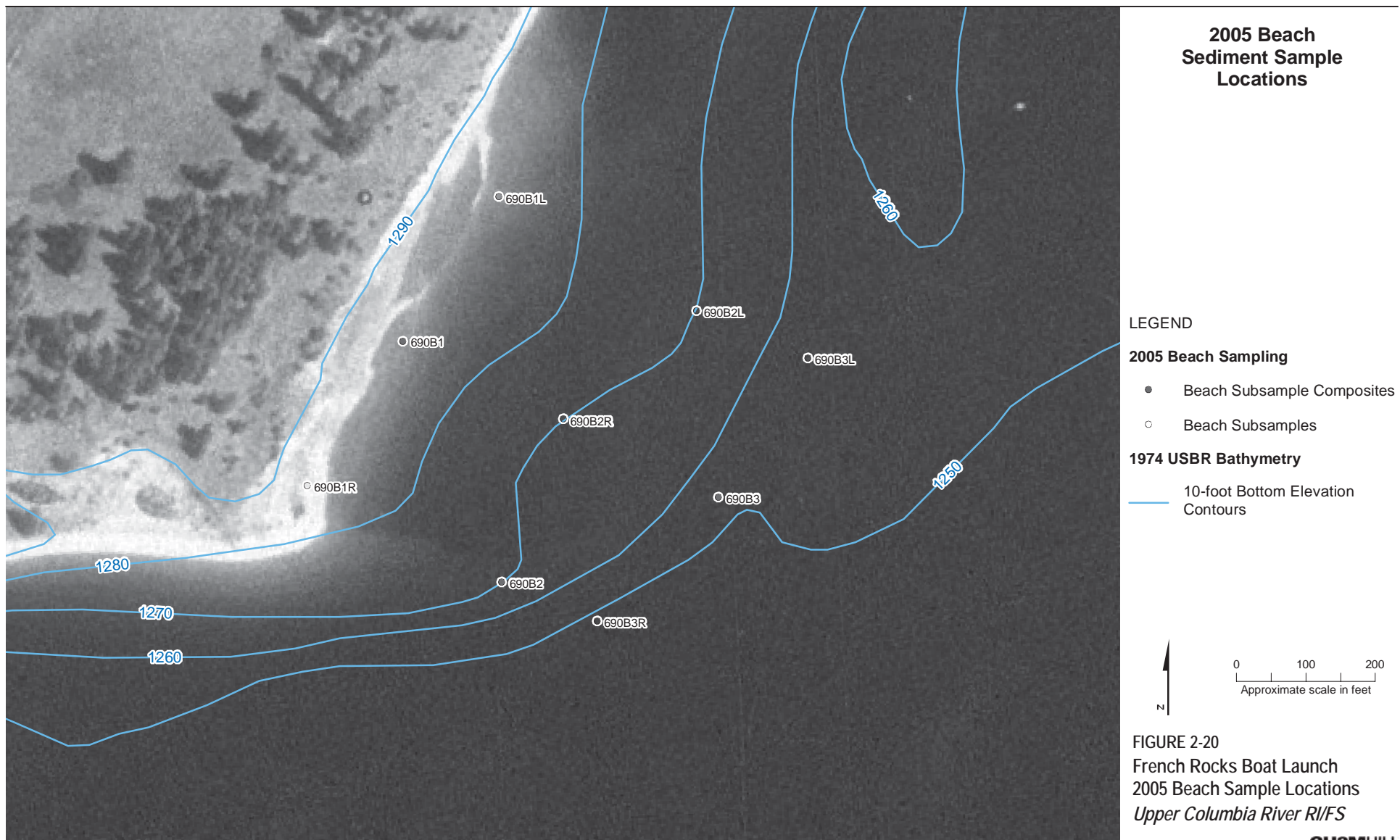
- 10-foot Bottom Elevation Contours

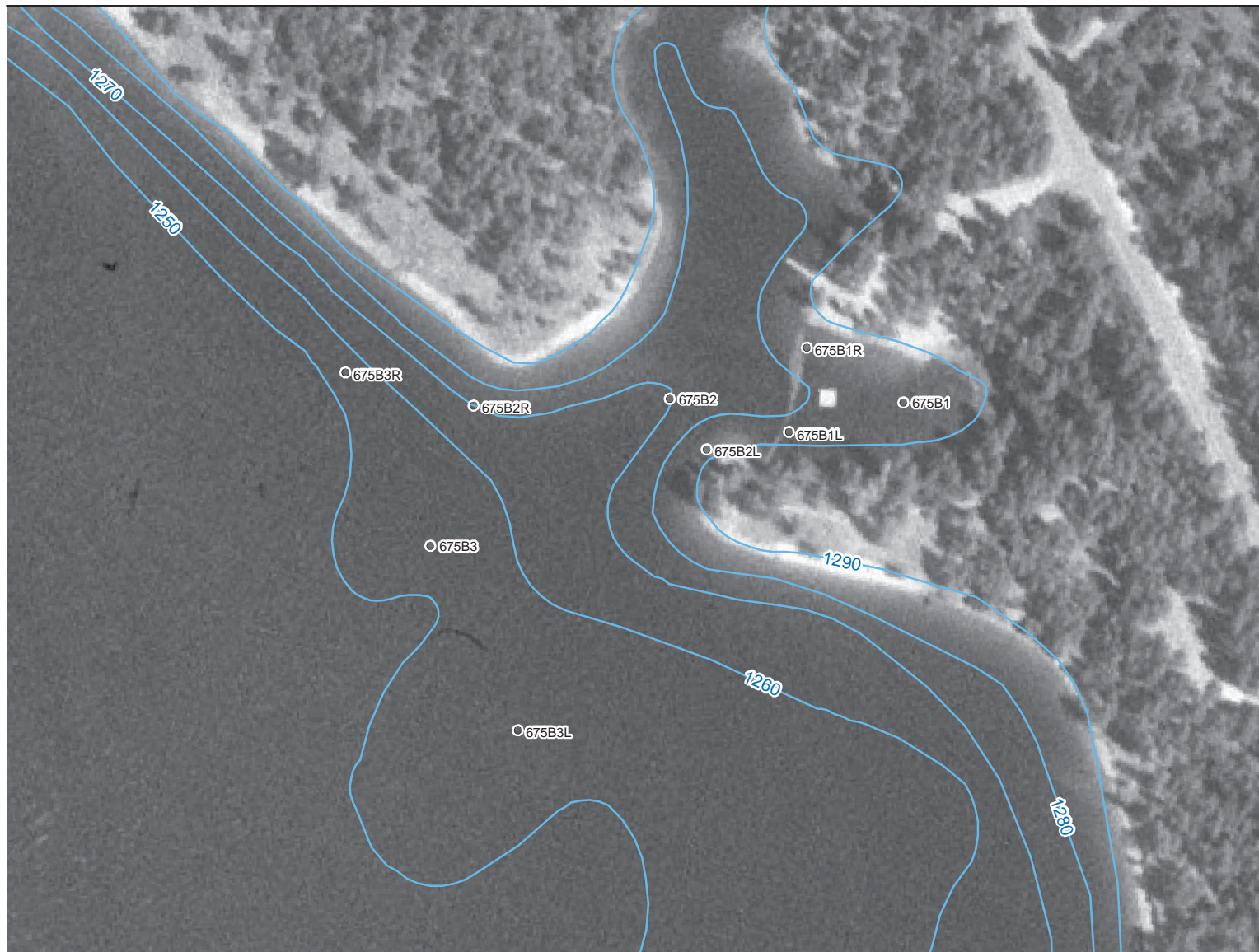


0 100 200
Approximate scale in feet

FIGURE 2-19
Haag Cove
2005 Beach Sample Locations
Upper Columbia River RI/FS

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2005 Beach Sediment Sample Locations

LEGEND

2005 Beach Sampling

- Beach Subsample Composites
- Beach Subsamples

1974 USBR Bathymetry

- 10-foot Bottom Elevation Contours

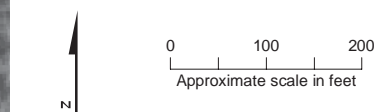
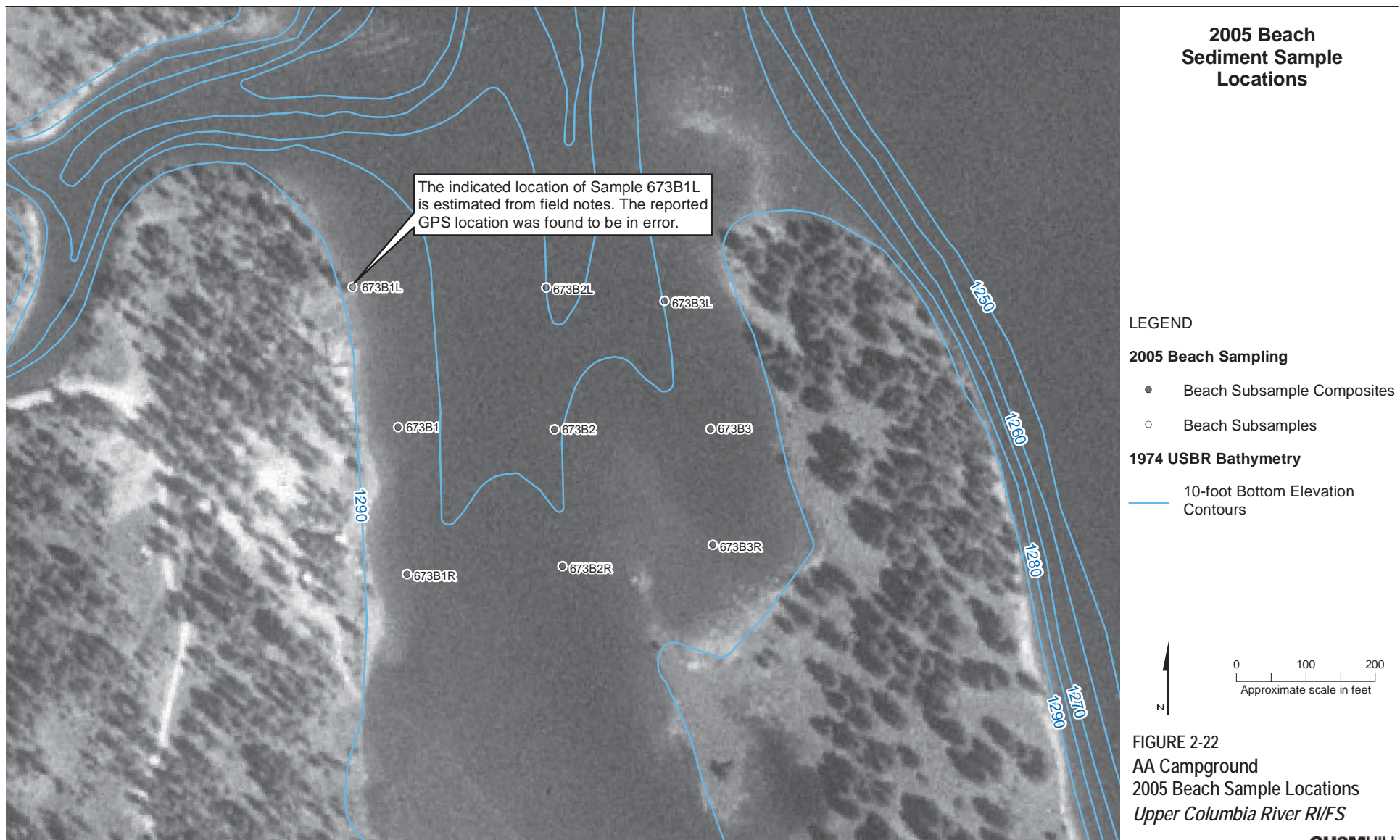
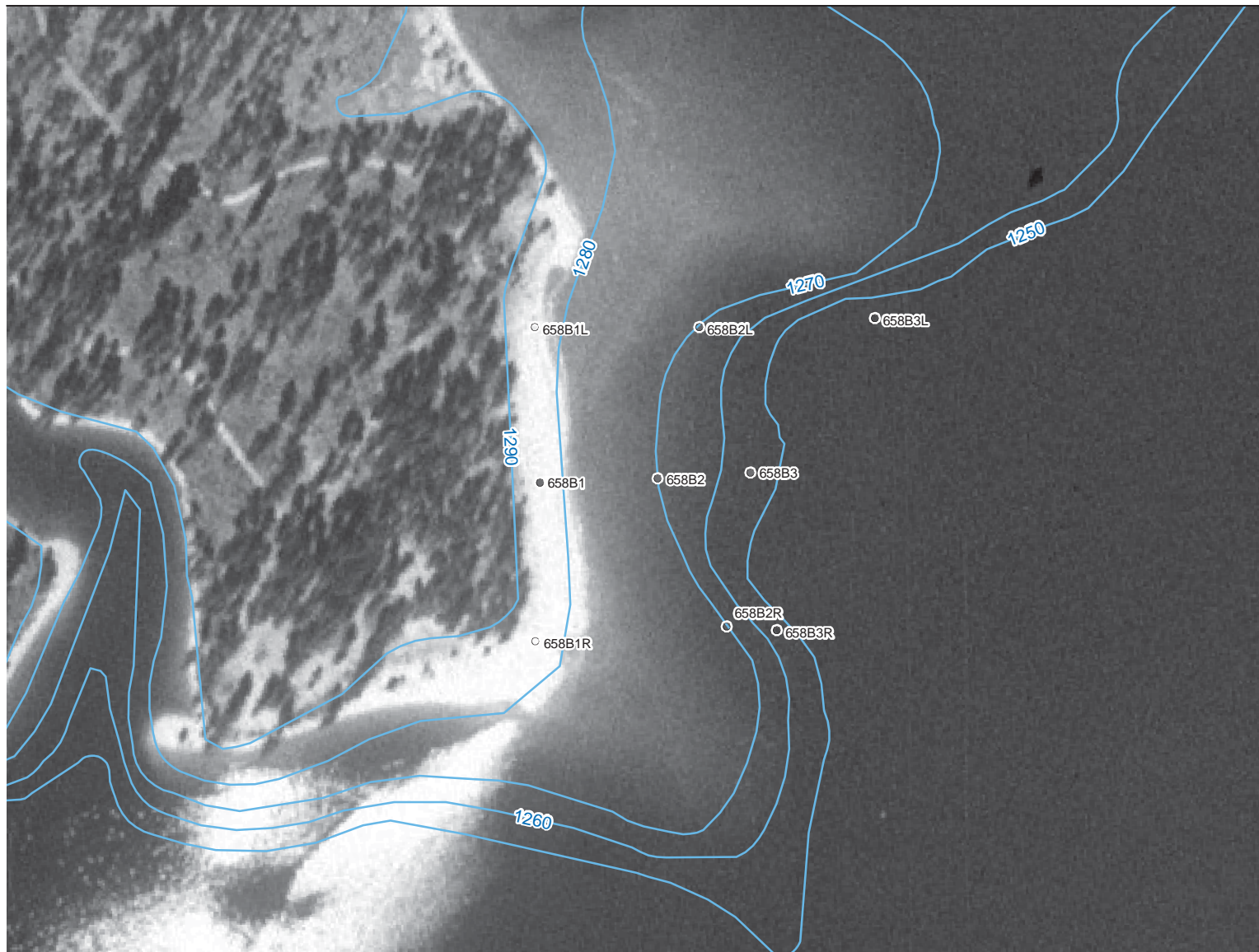


FIGURE 2-21
Cloverleaf Beach
2005 Beach Sample Locations
Upper Columbia River RI/FS

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2005 Beach Sediment Sample Locations

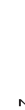
LEGEND

2005 Beach Sampling

- Beach Subsample Composites
- Beach Subsamples

1974 USBR Bathymetry

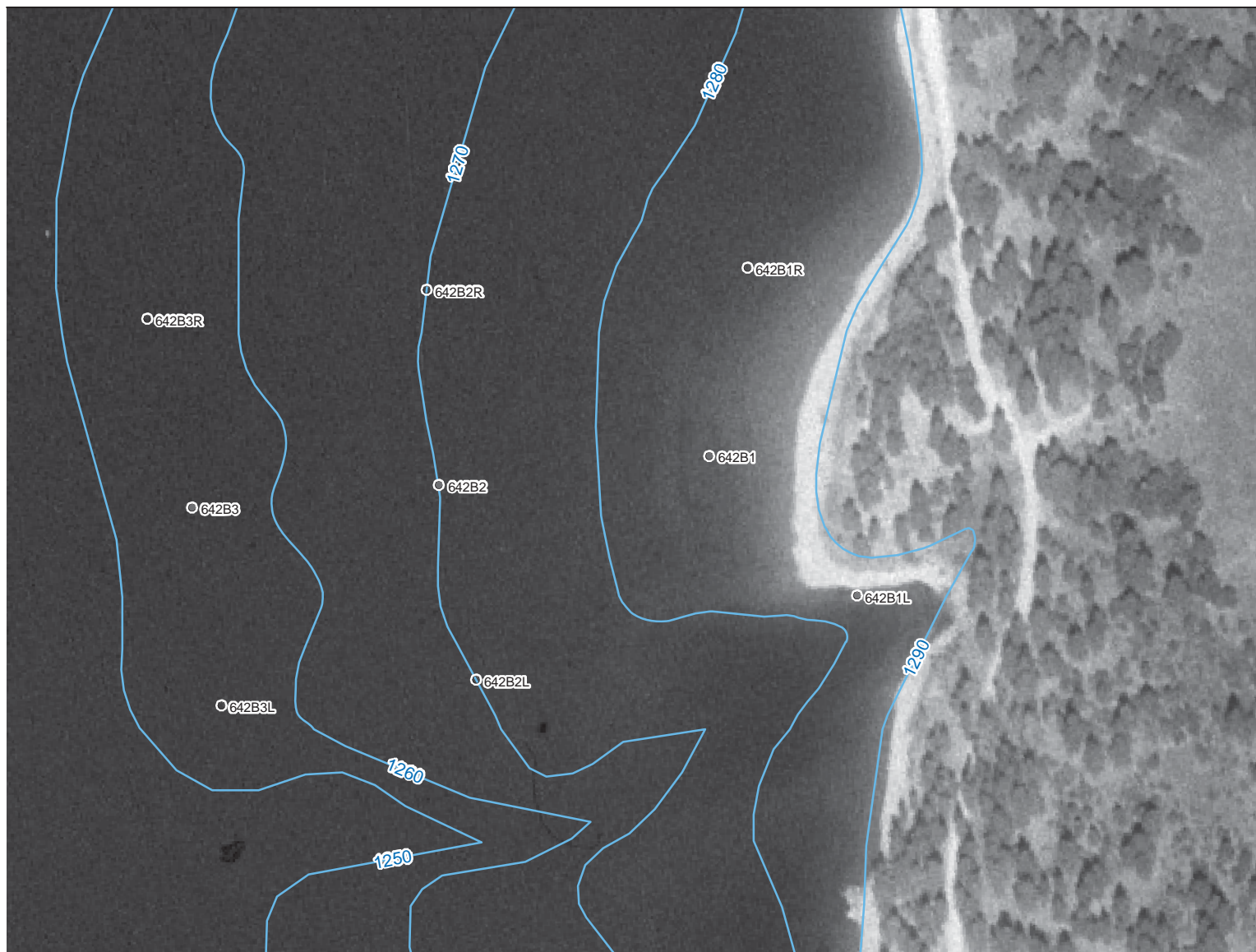
- 10-foot Bottom Elevation Contours



0 100 200
Approximate scale in feet

FIGURE 2-23
Rogers Bar Campground
2005 Beach Sample Locations
Upper Columbia River RI/FS

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2005 Beach Sediment Sample Locations

LEGEND

2005 Beach Sampling

- Beach Subsample Composites
- Beach Subsamples

1974 USBR Bathymetry

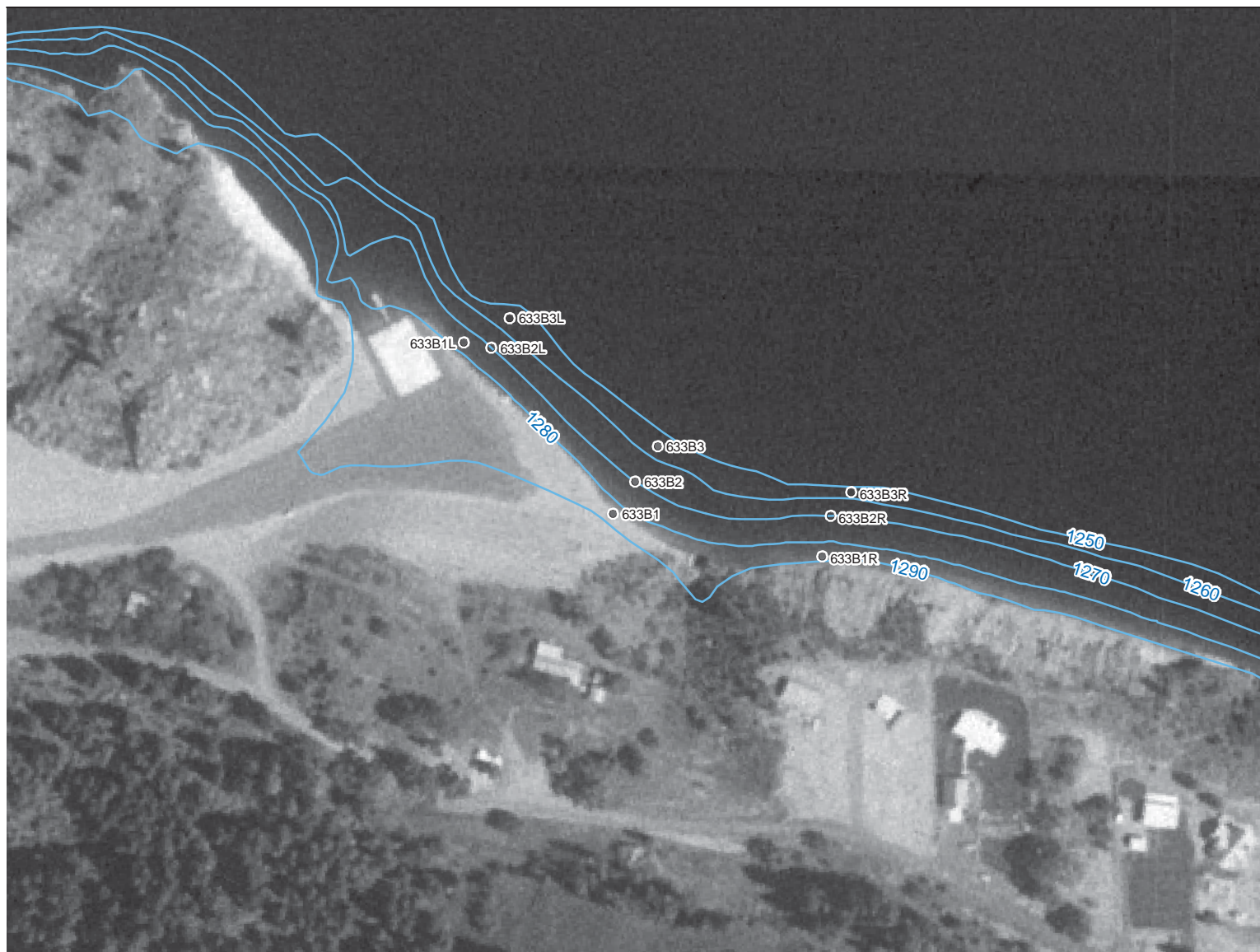
- 10-foot Bottom Elevation Contours



0 100 200
Approximate scale in feet

FIGURE 2-24
Columbia Campground
2005 Beach Sample Locations
Upper Columbia River RI/FS

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2005 Beach Sediment Sample Locations

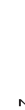
LEGEND

2005 Beach Sampling

- Beach Subsample Composites
- Beach Subsamples

1974 USBR Bathymetry

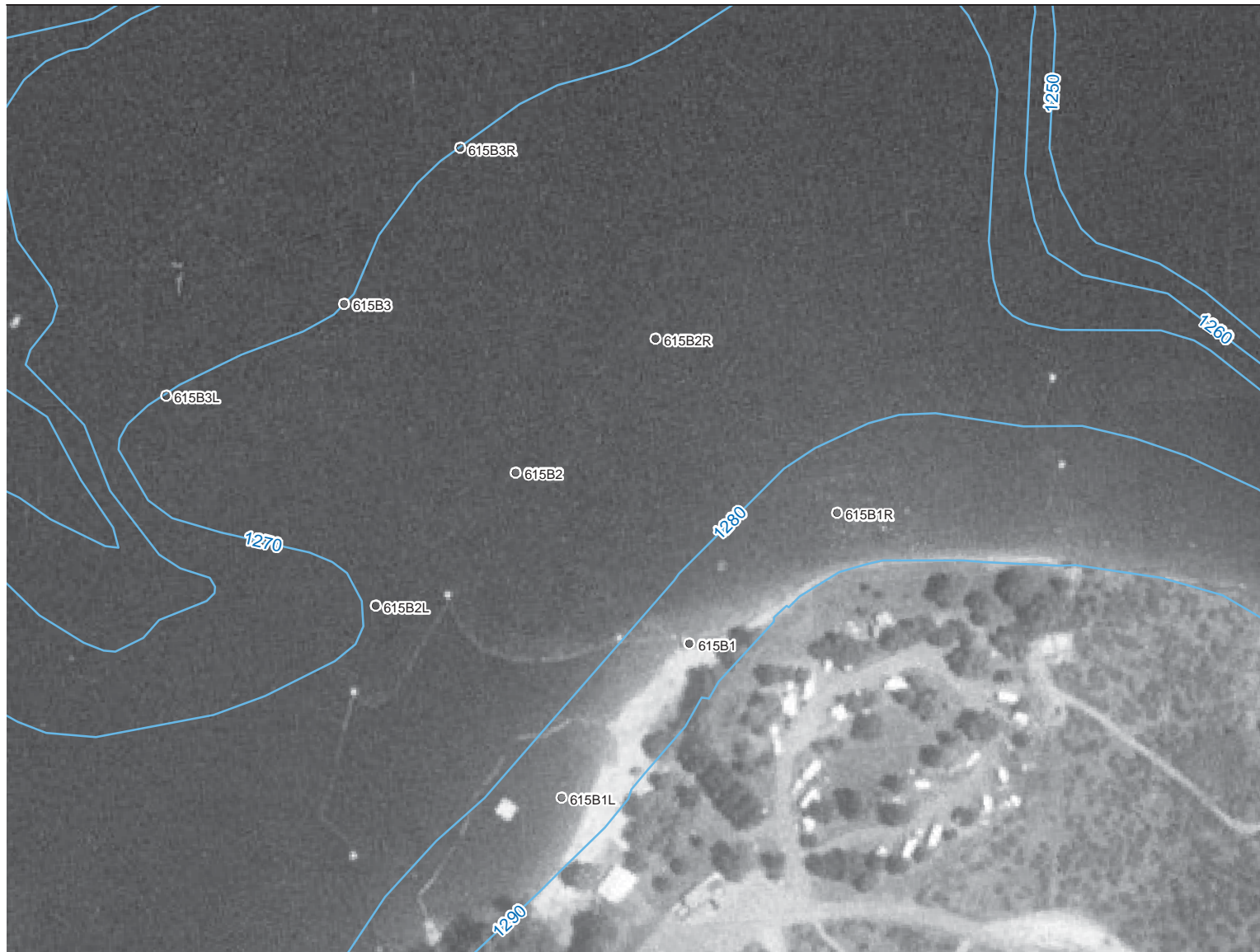
- 10-foot Bottom Elevation Contours



0 100 200
Approximate scale in feet

FIGURE 2-25
Lincoln Mill Boat Ramp
2005 Beach Sample Locations
Upper Columbia River RI/FS

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2005 Beach Sediment Sample Locations

LEGEND

2005 Beach Sampling

- Beach Subsample Composites
- Beach Subsamples

1974 USBR Bathymetry

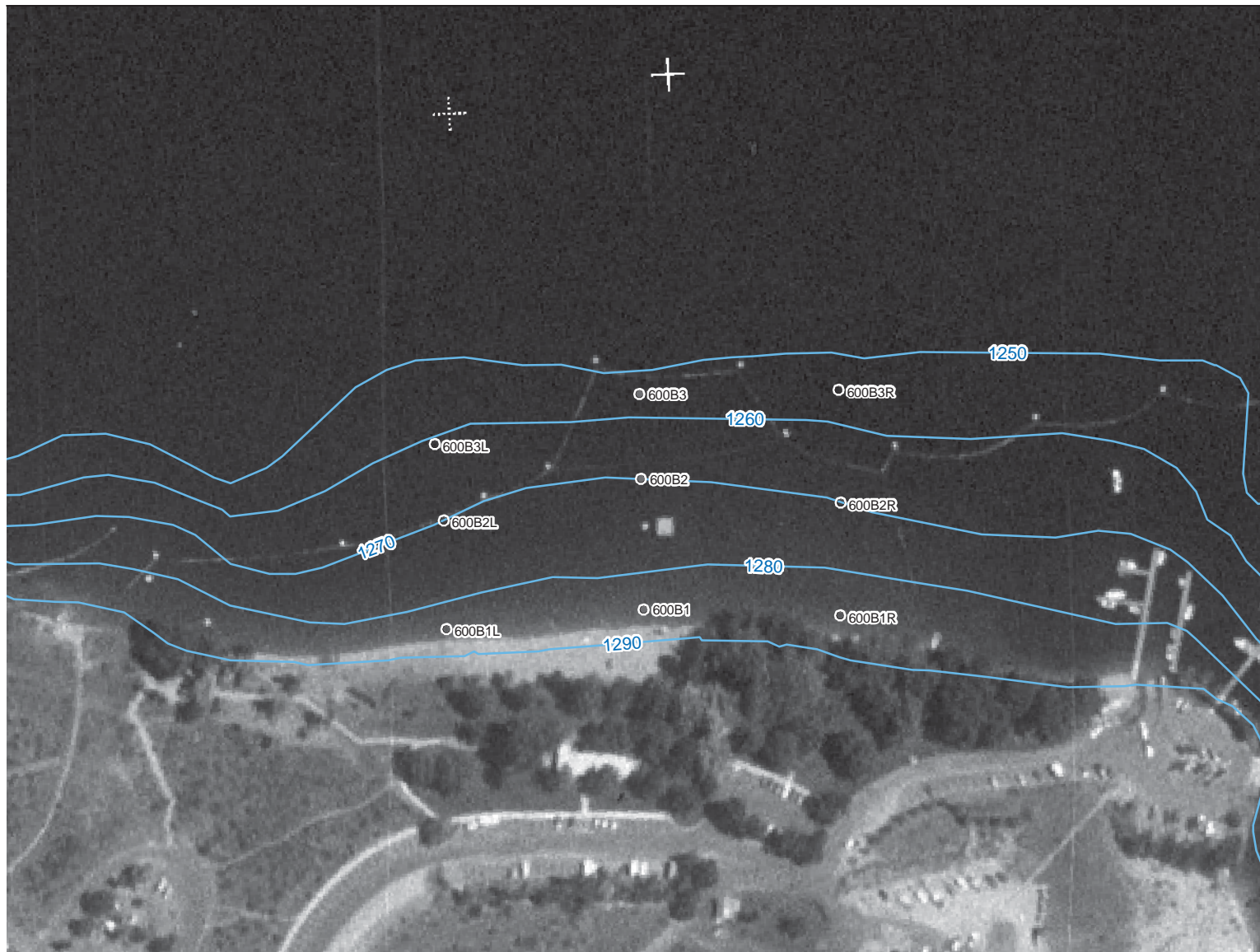
- 10-foot Bottom Elevation Contours



0 100 200
Approximate scale in feet

FIGURE 2-26
Kellers Ferry
2005 Beach Sample Locations
Upper Columbia River RI/FS

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2005 Beach Sediment Sample Locations

LEGEND

2005 Beach Sampling

- Beach Subsample Composites
- Beach Subsamples

1974 USBR Bathymetry

- 10-foot Bottom Elevation Contours

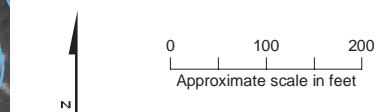
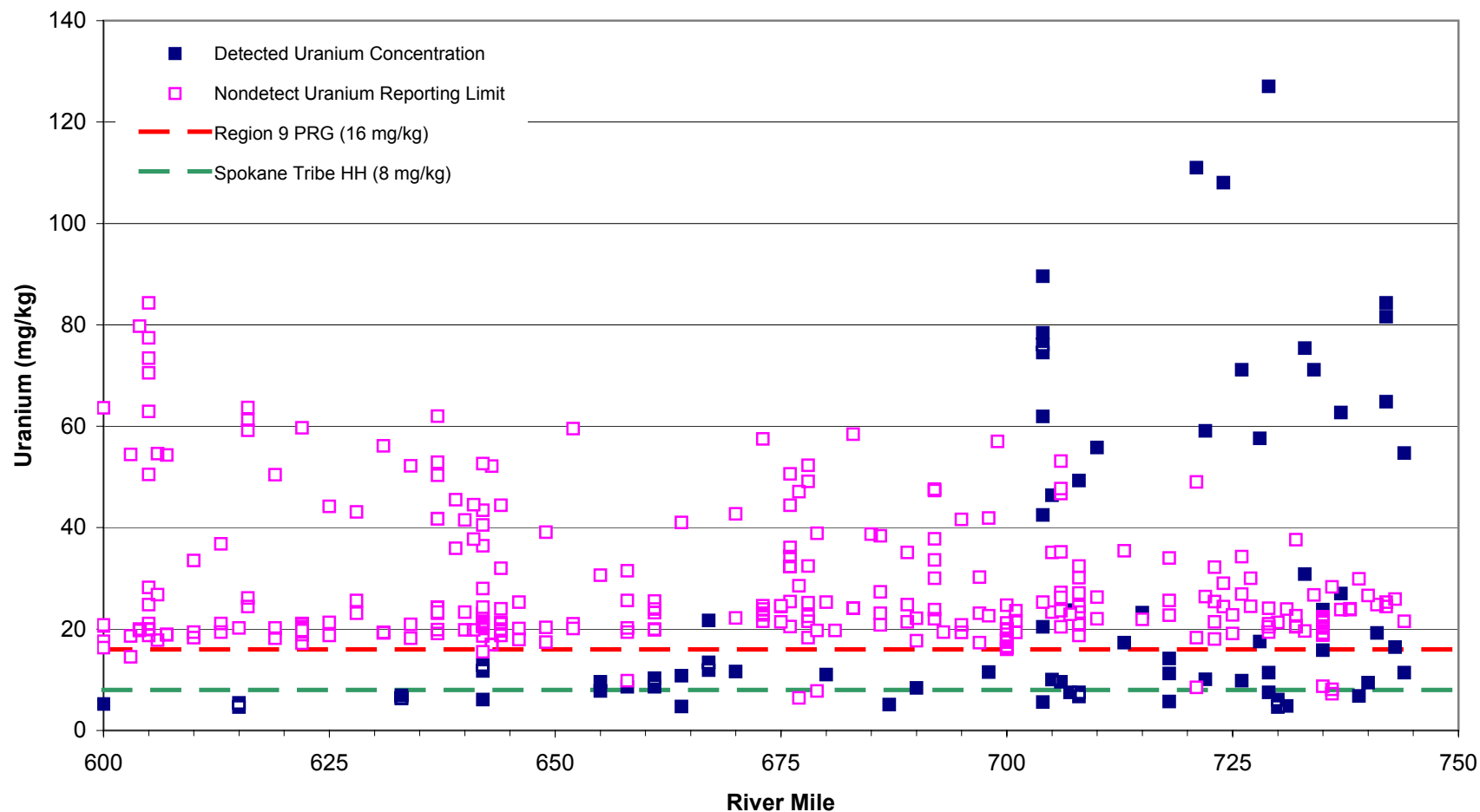


FIGURE 2-27
Spring Canyon Campground
2005 Beach Sample Locations
Upper Columbia River RI/FS

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Figure 2-28

Distribution of Uranium Results for 2005 Phase I Sediment Samples - Detected Concentrations and Nondetect Reporting Limits by River Mile
Upper Columbia River RI/FS



HH = human health
mg/kg = milligrams per kilogram
PRG = Preliminary Remediation Goal